

## CASE REPORT

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# Lumbar spine metastasis from squamous cell carcinoma of tongue

Javeed Iqbal, Arshad Ali, Issam Al-Bozom, Abdunnasser Alyafei

## ABSTRACT

**Introduction:** Squamous cell carcinoma (SCC) of tongue is among the commonest sites for oral cancers. It can cause significant morbidity due to local invasiveness but metastasize to lumbar spine with acute neurological deficits is extremely rare.

**Case Report:** We present a case of SCC of tongue that initially presented with acute back pain following exercise with no neurological deficits. Neuroradiological imaging showed compression fracture of L2 vertebra with no evidence of malignancy. One month later, he presented again with progressive lower limb weakness and radiological imaging revealed development of spinal metastatic disease with neural compression. Patients underwent an urgent lumbar spine decompression, fusion, and posterior instrumentation. Histopathology confirmed the diagnosis of metastasis from SCC of tongue and patient showed a good postoperative recovery.

**Conclusion:** Distant metastasis from SCC of tongue to lumbar spine is rare. A high index suspicion is warranted in patients presenting with spinal manifestations for early diagnosis to ensure a good neurological recovery.

**Keywords:** Carcinoma, FDG-PET/CT scan, Lumbar, Metastasis, Spine, Squamous cell, Tongue

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## INTRODUCTION

Head and neck cancer is the sixth most common type of cancer, representing approximately 6% of all cancer cases [1]. Tongue is among the commonest sites for oral cancers and squamous cell carcinoma (SCC) is the most malignant tongue tumor, accounting for 2% of all cancer deaths [1]. The incidence of spinal cord compression is reported in only 1–1.5% of all head and neck cancers [2, 3]. The involvement of cervical and thoracic spine is more common due to loco-regional metastasis to deep cervical lymph node chain, lying adjacent to vertebral bodies [3–5]. There are only a few anecdotal reports of lumbar vertebral involvement due to low incidence of hematogenous spread from SCC of lingual origin [3, 6, 7]. The clinical presentation of these lesions, their treatment, and prognosis are highly variable [2, 8]. We present a rare case of primary SCC of tongue that has been adequately treated locally with no evidence of loco-regional recurrence but then manifesting as an isolated lumbar spine metastasis with acute spinal cord compression. The report emphasizes on acute neurological presentation, neuroradiological imaging, surgical management, and prospects for neurological outcome.

## CASE REPORT

We report the case of a 35-year-old male presented to emergency room with one week duration of acute back

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pain that started suddenly by heavy weightlifting during exercise. His neurological examination was normal. One year ago, he was diagnosed to have SCC of right side of tongue. He had undergone wide local excision of right tongue with ipsilateral neck dissection and contralateral excisional lymph node biopsy. Histopathological report confirmed as a poorly differentiated SCC of the right lateral tongue with lymphovascular invasion and staged as T3 (tumor size >4 cm), N2b (multiple ipsilateral lymph node involvement with none >6 cm) and M0 (no metastatic lesions). He received adjuvant chemotherapy with cisplatin and concurrent local radiotherapy for six weeks. Past six months, his surveillance magnetic resonance imaging (MRI) of head and neck and whole-body positron emission tomography/computed tomography (PET/CT) scan showed no residual or recurrence of malignancy. On current presentation, CT scan of lumbar spine showed multiple osteolytic foci in the body of L2 vertebra with reduction in vertebral body height (Figure 1A). Magnetic resonance imaging lumbar spine of the fractured L2 vertebra showed diffuse low signal intensity on T1 and diffuse bright signal intensity on the short tau inversion recovery (STIR) images (bone marrow edema) with extension of the bone marrow edema to the right and left pedicles of the vertebra. There was no medullary expansion of the vertebra and no extra vertebral extension of the lesion with no gross paraspinal or epidural components. Differential diagnosis was entertained in favor of post traumatic fracture of the vertebra more than pre-existing underlying bone lesion (Figure 1B and C). Fluorodeoxyglucose (FDG)-PET/CT scan did not show any local or regional recurrence and there was no radiotracer uptake in L2 vertebra (Figure 2). At this stage, the patient was managed with analgesics and lumbar spine prosthetic brace.

After one month, patient presented again to emergency room with sudden onset progressive weakness of lower limbs for the last three days. There were no symptoms related to bowel and bladder control. On neurological examination, he had decreased power in right lower limbs of 3/5 at knee and 0/5 at ankle distally. The pin-prick sensation was also diminished below L2 dermatome. Left lower examination was normal. Magnetic resonance imaging of lumbar spine showed significant reduction in the height of L2 vertebral body along with abnormal signal intensity of L1 and L3 vertebral bodies with development of large prevertebral and bilateral paravertebral enhancing soft tissue component extending from L1 to L3 level. There was also intraspinal extradural extension causing significant compression on the thecal sac at L2 vertebral level. Heterogenous post-contrast enhancement of bilateral psoas and bilateral lumbar paravertebral muscles was also present. Cervical and thoracic spine appears grossly unremarkable with no evidence of abnormal vertebral body bone marrow signal intensity (Figure 3). The patient underwent an urgent L1 to L3 decompression laminectomy and trans-pedicular screw fixation from T11 to L4 using CT navigation (Figure 4). Histopathology (Figure 5) sections

show a poorly differentiated squamous cell carcinoma characterized by sheets of large polygonal squamous cells having intercellular bridges with abundant eosinophilic cytoplasm, central rounded nuclei, prominent nucleoli, and frequent mitotic figures. The tumor cells infiltrate the bony trabeculae (Figure 1A) as well as perispinal adipose tissue (Figure 1B). Postoperatively, the patient had immediate



Figure 1: Lumbar spine CT scan, sagittal view (A) showing multiple osteolytic foci in the body of L2 vertebra with reduction in vertebral height. MRI T1-weighted sagittal view (B) showed diffuse low signal intensity of fractured vertebra and STIR images, sagittal view (C) with corresponding bright signals intensity. There is no medullary expansion, or cortical erosion and no extra-vertebral soft tissue extension, favoring diagnosis of post-traumatic fracture.

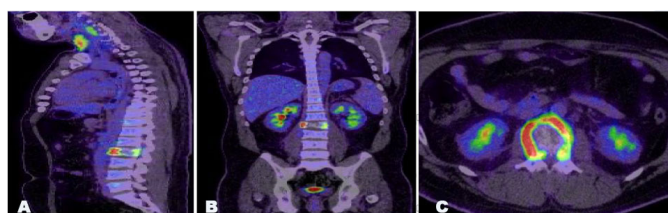


Figure 2: FDG-PET CT scan of whole body showed no FDG-avid foci of malignancy. Compressed L2 vertebra showed no hypermetabolic activity inside except a rim of intense FDG uptake, suggestive of no malignancy.

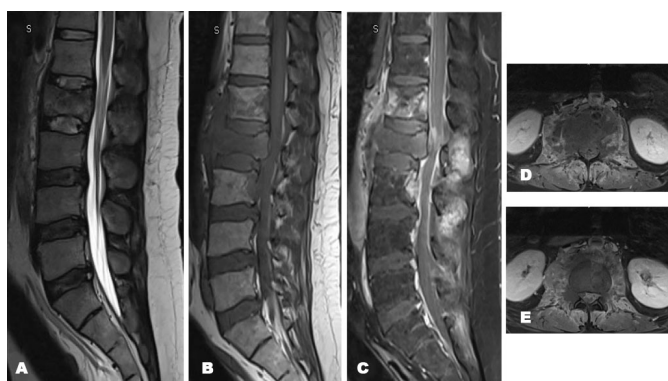


Figure 3: MRI of lumbar spine showing sagittal views of T2-weighted (A), T1-weighted (B) and T1-weighted post-gadolinium enhanced views (C) along with axial section (D and E). There is significant reduction in size of L2 vertebral body with abnormal signal intensity of L1 and L3 vertebral bodies. Post-contrast MR images showed involvement of large bilateral paravertebral soft tissues with intraspinal extradural extension causing significant compression on the thecal sac at L2 level.

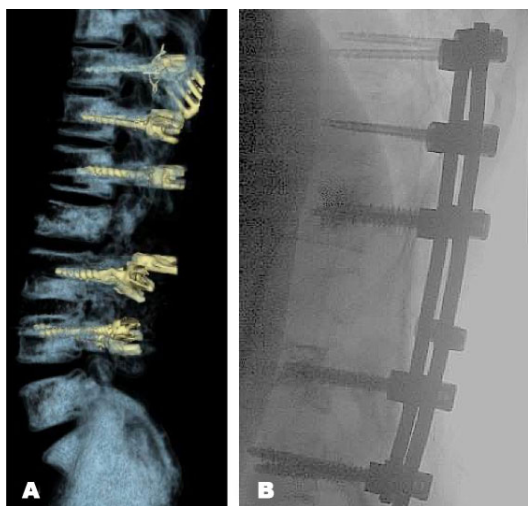


Figure 4: Intraoperative CT scan reconstructive sagittal view (A) and X-ray lumbar spine showing pedicle screws fixation in situ (B).

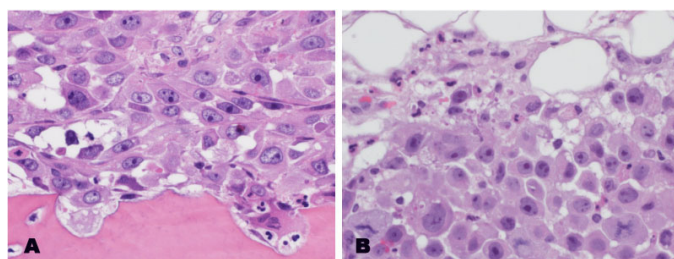


Figure 5: Light microscopic examination (H&E ×600) showing squamous cell carcinoma infiltrating bone (A) and infiltrating adipose tissue (B).

decrease in his back pain and showed progressive neurological improvement with neurorehabilitation. He was planned for palliative radiotherapy to whole spine followed by chemotherapy by oncology team.

## DISCUSSION

By far the commonest histological type of oral cancers is squamous cell carcinoma (SCC), accounting for 95% of all cases [1, 2, 9]. The most frequently involved sites are anterior 2/3 of the tongue and floor of mouth [10]. Loco-regional lymph nodes are the earliest sites for direct invasiveness [11]. Hematogenous spread occurs to distant metastatic organs including lungs (70%), liver (42%), and bone (15%) [5, 9, 11]. Vertebral involvement is extremely rare (<1%) from SCC of oral cancers [2]. Extracapsular spread from lymph nodes to regional and distant sites is a predictor of recurrence leading to high morbidity and mortality [4, 5, 12]. Vertebral involvement is predominantly limited to the cervical and upper thoracic spine due to direct lymphatic pathways from primary mucosal sites in the head and neck via adjacent lymph nodes [5, 8, 9, 11]. Lumbar vertebral involvement is extremely rare due to low incidence of hematogenous spread [3, 6]. Our case was not initially suspected to

have distant isolated vertebral metastasis as there was no tumor recurrence to loco-regional lymph nodes on surveillance MRI, following chemo-radiotherapy.

Fluorodeoxyglucose-positron emission tomography scan is considered as a volumetric and metabolic biomarker, and it estimates tumor volume, based on the distribution of metabolic activity [9]. Fluorodeoxyglucose-PET/CT is considered highly sensitive for the diagnosis and initial staging of several types of malignancies including head and neck carcinomas [10, 12]. Combined PET/CT has improved sensitivity and specificity compared with MRI or CT alone in head and neck cancer imaging [10, 12, 13]. Although most solid tumors demonstrate high uptake of FDG, but a low FDG uptake may be due to various reasons, including tumors with low glucose metabolism, low cellularity (a small tumor size), and reduced number of metabolically active tumor cells or necrosis following radio-chemotherapy [13, 14]. In our case, earlier FDG-PET/CT scan may be false negative. It is possibly confounded either due to low cellular volume at an early stage or being it to be post-chemotherapy necrosis until it presented again with a sudden progressive neurological manifestation. Similarly, MRI spine may not differentiate a pathological fracture in earlier stages of metastasis [15]. In our case MRI of L2 fractured vertebra showed diffuse low signal intensity on T1 and diffuse bright signal intensity on the STIR images (bone marrow edema) with extension to the right and left pedicles of the vertebra. There was no cortical erosion or medullary expansion of the L3 vertebra with no extra-vertebral extension of the lesion or any gross paraspinal or epidural components. These findings were interpreted in favor of post-traumatic fracture of the vertebra more than pre-existing underlying bone lesion in the context of acute presentation with sudden onset pain during a strenuous exercise session.

Radiotherapy is the mainstay of treatment for most cases of nerve root or spinal cord compression but there is a risk of radiation-induced myelopathy [3]. Preciado et al. [16] proposed surgery for patients with unstable spine, in patients with no improvement after two days of radiotherapy and those with a life expectancy of greater than six months. Our case initially presented with back pain after strenuous exercise with no neurological deficits and he was managed for spinal fracture with analgesics and lumbar prosthetic brace. Subsequently, he presented with acute neurological deficits due to spinal cord compression. In acute spinal cord compression, the most important factor in determining neurological recovery is the level of neurological function at the beginning of therapy. Prompt diagnosis is essential if neurological function is to be conserved successfully [3, 6, 7, 16]. Pain is the most frequent presenting symptom of nerve root or spinal cord compression. It is often radicular in nature and may be associated with motor and sensory changes in the arms and legs and autonomic dysfunction [3, 8]. Our case presented with rapidly progressive acute neurological deterioration of short duration following

back pain of one month duration. He underwent urgent spinal decompression and instrumentation that provided him with immediate postoperative pain relief and good postoperative neurological recovery.

## CONCLUSION

Lumbar vertebral metastasis from SCC of tongue is extremely rare. High index of clinical suspicion is required for early diagnosis despite equivocal radiological imaging findings. Surgical decompression and spinal instrumentation ensure early neurological recovery in patient presenting with acute neurological deterioration.

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## Author Contributions

Javeed Iqbal – Conception of the work, Design of the work, Acquisition of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Arshad Ali – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Issam Al-Bozom – Acquisition of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Abdulnasser Alyafei – Conception of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

## Guarantor of Submission

The corresponding author is the guarantor of submission.

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**Conflict of Interest**

Authors declare no conflict of interest.

**Data Availability**

All relevant data are within the paper and its Supporting Information files.

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