Deceptive Radiographic Features on Surveillance Imaging of Intraneural Metastatic Deposits In Metastatic Renal Cell Cancer

Lena Mary Houlihan, MD
Conor Ledingham, MD
Michael GJ O’Sullivan MD

Department of Neurosurgery,
Cork University Hospital,
Wilton road,
Cork
Ireland
Disclosure

• DISCLOSURES: None
• FINANCIAL SUPPORT: None
Introduction

• Renal cell carcinoma is an aggressive malignancy known most commonly to metastasise to lymph nodes, lung, bone, liver and brain. Intracranial metastases are a well acknowledged entity. Spinal metastases are a common insidious pathological manifestation of the oncological disease process, but less common are intramedullary and intraneural spinal metastases. Differential diagnosis of such a pathology can be difficult in the presence of conflicting radiological evidence. We present a unique case of an intraneural metastasis presenting with non-aggressive radiological features.
Methods

• This case report details the clinical, diagnostic, surgical and therapeutic progression of a 54 year old gentleman diagnosed with metastatic renal cell carcinoma with focal rhabdoid differentiation, stage pT3aN0M1, and concomitant parietal lesions manifesting in homonymous hemianopia. Following craniotomy, stereotactic radiotherapy and systemic chemotherapy he presented symptomatically with right lower limb L5 radiculopathy.
Case report

• This 54 year old right hand dominant man presented in 2016 with a right homonymous hemianopia, right upper limb weakness and intermittent dizziness. CT Brain revealed a 14mm enhancing left parietal lobe lesion with significant circumferential vasogenic oedema. A subsequent CT TAP revealed a 7mm left upper lobe pulmonary nodule, a 3mm right upper lobe lesion, and a 10cm mass in the left kidney.

• He underwent a stereotactic craniotomy and excision of the left parietal lesion. Histopathology confirmed metastatic clear cell carcinoma with appearance and immunophenotype suggestive of primary carcinoma of the kidney. Post-operatively he underwent stereotactic radiosurgery to the surgical bed.

• Approximately two months post neurosurgical intervention the patient underwent a cytoreductive left radical nephrectomy and lymph node dissection. A diagnosis of conventional clear cell renal cell carcinoma, with focal rhabdoid differentiation, stage pT3aN0M1 margin negative was made.

• 16 months after presentation routine surveillance revealed a new 6mm asymptomatic left parietal lobe lesion. This new lesion was managed with stereotactic radiotherapy.
Simultaneously, the patient complained of new severe right sided L5 radicular pain. There was no focal neurological deficit. MRI lumbar spine revealed a well-defined heterogenous cystic lesion expanding the right exit foramina at L5/S1 measuring 2.8 X 2cm with no significant post contrast enhancement. There was surrounding bony remodelling with expansion of the neural foramen. Radiographic features were suggestive of a benign schwannoma (Figure 1). He was managed with analgesia and radiological surveillance. The patient improved clinically with a short course of steroids.

Image 1: Sagittal and axial post contrast MRI lumbar spine showing large right L5 lesion with patchy enhancement for symptomatic investigation at 16 months post original oncological diagnosis showing benign radiographic features such as faint enhancement, cystic components and surrounding bony remodelling with widening of the foramen
19 months after presentation, routine surveillance revealed further systemic disease progression with multiple pulmonary nodules. He still had intermittent severe right lower limb radiculopathy with paraesthesia in his right big toe, but denied any weakness, bowel, bladder or saddle symptoms. Serial imaging of his lumbar spine revealed that the L5 lesion’s radiographic features were stable (Figure 2). He was commenced on Dexamethasone which again provided symptomatic relief.

Image 2: Sagittal and axial post contrast MRI lumbar spine showing large right L5 lesion with persistent patchy enhancement at 1 year’s surveillance imaging post original lesional identification with static radiographic features as reported and concurred by multi-disciplinary team.
Case Report

• 9 months following this, the radicular pain became refractory to medical management. At this stage the patient underwent a right L5/S1 laminotomy and debulking of the intraneural lesion.

• Macroscopically a large lesion of the L5 nerve root was identified. Exploration revealed an expansive haemorrhagic collection. This was evacuated and sent for biopsy. Frozen section was suspicious for a metastatic deposit. Given the patient was neurologically intact pre-operatively, the decision was made to debulk the lesion’s core and preserve the nerve root.

• Post-operatively the patient’s radicular pain completely resolved.

• Biopsy confirmed metastatic carcinoma, appearance and immunophenotype compatible with derivation from this patient’s known renal cell carcinoma. This was histologically identical to his original renal primary disease. Post-operatively the patient underwent stereotactic radiosurgery to the L5 nerve root.

• Unfortunately the patient’s systemic disease continued to progress regardless of adjuvant treatment. The patient died 3 years following his original diagnosis.
Discussion

• The decision to operate on intraneural lesions known to be malignant is indicated for either diminishing of disease burden – for which radiation therapy is also given despite its ineffective nature– versus symptomatic relief.

• Given the poor prognosis of patients with established metastatic disease of the spine in renal cell carcinoma, it is prudent presently to recommend operative intervention only in cases where the patient is surgically fit and the indication is for symptomatic, or functional improvement as opposed to for management of disease burden.

• There have been few scenarios where malignant disease has been identified in the presence of benign radiographic findings. With regards to renal cell carcinoma, a low-attenuated renal mass on unenhanced CT, typically defined as fewer than 20 Hounsfield units, are frequently considered to be cystic lesions with low malignant suspicion.

• Radiographic characteristics are largely diagnostically accurate. However this case highlights the weight which must be put on clinical assessment and patient history.

• In this case the patient developed spinal symptoms 16 months after the initial diagnosis with lesional identification at this time. However, a metastatic diagnosis of the spine was made at 28 months following initial presentation, because the lesion was observed given its radiographic features. Arguably this patient’s survival was greater than the median survival if Time 0 is taken at original lesion diagnosis.
Conclusion

• This is the first case of an intraneural metastatic deposit from renal cell carcinoma which showed benign radiographic features and demonstrated a stable appearance on surveillance imaging over a significant period of time.

• This case, as well as the previously published data, would suggest that clinicians should have a high index of suspicion for a metastatic process in patients regardless of convincing radiological features. We also recommend in the present management of renal cell carcinoma, given the likely heavy disease burden at the time of spinal metastatic diagnosis, that operative intervention is only indicated for symptomatic, neurological and quality of life improvement.