Unusual presentation of more common disease/injury

Metastatic disease causing unilateral isolated hypoglossal nerve palsy

R Fernandes

Department of Neurology, Kingston Hospital, Surrey, UK

Correspondence to R Fernandes, rfernandes@doctors.org.uk

Summary

The authors present the case of a middle-aged woman diagnosed with lobular carcinoma in situ in her right breast. She eventually underwent a mastectomy and reconstruction. Histology revealed grade II invasive ductal carcinoma and she was commenced on adjuvant letrozole. The following year a MRI scan revealed she had developed spinal metastases and CT confirmed the presence of liver and lung metastases. She presented with a 5-month history of tongue weakness and difficulty manipulating food to the back of her mouth. On examination, there was marked right-sided hemiatrophy of the tongue with deviation of the tongue to the right side upon protrusion. MRI demonstrated ill-defined enhancing material close to the intracranial opening of the right hypoglossal canal. The patient was referred for consideration of radiotherapy. Due to the comorbidities of the patient, she was not a candidate for neurosurgical intervention

BACKGROUND

Palsy of the hypoglossal nerve has been widely reported in the literature. Almost half of such cases are related to tumours.¹ Examples of other aetiologies causing palsy of this cranial nerve include radiation therapy and postinfectious syndromes. In the majority of cases, neoplastic nerve involvement leads to unilateral dysfunction of an assortment of cranial nerves. We present the case of a middle-aged woman with signs and symptoms of an isolated unilateral XII cranial nerve palsy, later found to be a consequence of metastatic disease.

CASE PRESENTATION

A 58-year-old woman was diagnosed with lobular carcinoma in situ in her right breast. Eight years later she was found to have recurrence and promptly underwent a mastectomy and reconstruction. Histology revealed grade II invasive ductal carcinoma and she was commenced on adjuvant letrozole. The following year a MRI scan revealed she had developed spinal metastases and CT confirmed the presence of liver and lung metastases.

She presented with a 5-month history of tongue weakness and difficulty manipulating food to the back of her mouth. The patient reported no pain, dysphagia or dysphasia. On examination, there was marked right-sided hemiatrophy of the tongue with deviation of the tongue to the right side upon protrusion. Weakness of the tongue was demonstrated on objective testing. However, sensation to touch and taste remained intact. The rest of the neurological examination was unremarkable with no evidence of weakness, fasciculations or any other features of concern.

There were no signs of infection or inflammation. Routine blood investigations including bone profile did not reveal any abnormality. Bone scan revealed widespread areas of increased activity among the axial skeleton, particularly the lower thoracic and mid lumbar spine. Further areas of increased uptake were also seen within the ribs, skull vault

and both proximal femora. MRI demonstrated abnormal bone texture in the skull base and upper cervical spine, compatible with malignant infiltration. There was also some ill-defined enhancing material close to the intracranial opening of the right hypoglossal canal. The average hypoglossal canal intracranial and extracranial diameters have been reported as 6.5 ± 1.3 and 6.6 ± 1.1 mm, respectively.² Therefore, any narrowing is likely to have a compressive impact upon the hypoglossal nerve the canal accommodates.

INVESTIGATIONS

See Case Presentation.

OUTCOME AND FOLLOW-UP

The patient was referred for consideration of radiotherapy. Due to the comorbidities of the patient, she was not a candidate for neurosurgical intervention.

DISCUSSION

The hypoglossal nerve is responsible for the motor supply to the tongue and innervates the genioglossus, hypoglossus, chondroglossus, inferior belly of the omohyoid and other intrinsic tongue muscles.³ The nuclei of this nerve is situated in the median eminence of the dorsal medulla.⁴ Although the exact trajectory of this cranial nerve is variable, it can broadly be classified into three distinct parts: cisternal, intracranial and extracranial. The hypoglossal canal is situated above the occipital condyle and lies in an anterolateral direction.⁵ The purpose of the canal is to transmit the hypoglossal nerve and aids the differentiation the intracranial and extracranial components of the nerve. It opens into the skull base above the anterior third of the condyle.

The tongue has dual supranuclear innervation and consequently unilateral upper motor neuron lesions will not result in lingual weakness.⁴ In comparison, lower motor neuron lesions can result in atrophy, fasciculations and lingual weakness, as demonstrated in our case report. Skull

metastasis causing unilateral hypoglossal nerve palsy has been described in previous studies,¹ however, in such cases, the palsy is more commonly found in conjunction with other co-existing cranial nerve palsies. This is largely due to its anatomical relation to other important anatomical structures throughout its course.⁶

Although tumours account for a substantial proportion of the aetiology of hypoglossal nerve palsies, it is important to exclude other possible causes such as trauma, medullary infarctions, multiple sclerosis, Guillain–Barre neuropathy and infection.⁶ MRI remains the imaging investigation of choice for visualisation of the hypoglossal canal. In addition electromyography studies of the tongue may be useful in differentiating a flaccid from a spastic paralysis.⁷ Treatment of the palsy is focused on the management underlying aetiology. The treatment rationale should be made with consideration to the patient's comorbidities and underlying diagnosis. In our case, a surgical intervention was deemed inappropriate and radiotherapy or conservative management were offered to the patient.

Learning points

- ▶ Metastatic infiltration must be a differential for any unilateral cranial nerve palsy.
- ▶ Skull metastasis causing unilateral hypoglossal nerve palsy is more commonly found in association with other cranial nerve palsies.
- ▶ Treatment of cranial nerve palsies is focused on the management underlying aetiology.
- ▶ Management options for a cranial nerve palsy associated with skull metastasis may include neurosurgery, radiotherapy or conservative management.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Keane JR.** Twelfth-nerve palsy. Analysis of 100 cases. *Arch Neurol* 1996;**53**:561–6.
2. **Kizilkanat ED,** Boyan N, Soames R, Oguz O. Morphometry of the hypoglossal canal, occipital condyle and foramen magnum. *Neurosurg Q* 2006;**16**:121–5.
3. **Rontal E,** Rontal M. Lesions of the hypoglossal nerve—diagnosis, treatment and rehabilitation. *Laryngoscope* 1982;**92**:927–37.
4. **Rotta FT,** Romano JG. Skull base metastases causing acute bilateral hypoglossal nerve palsy. *J Neural Sci* 1997;**148**:127–9.
5. **Bademci G,** Yasargil MG. Microsurgical anatomy of the hypoglossal nerve. *J Clin Neurosci* 2006;**13**:841–7.
6. **Manfredi M,** Merigo E, Pavesi G, *et al.* Tongue lesions and isolated hypoglossal nerve palsy: a case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;**104**:e18–20.
7. **Hemmings KW.** Isolated hypoglossal nerve palsy as a presenting feature of prostatic carcinoma—a case report. *Br J Oral Maxillofac Surg* 1990;**28**:125–7.

This pdf has been created automatically from the final edited text and images.

Copyright 2010 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Fernandes R. Metastatic disease causing unilateral isolated hypoglossal nerve palsy. *BMJ Case Reports* 2010;10.1136/bcr.05.2010.2998, date of publication

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow