CASE REPORT

Numb chin syndrome: an ominous sign of mandibular metastasis

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Accepted 28 March 2018

SUMMARY

A 51-year-old woman a known case of stage 2 breast carcinoma in 2006 and underwent left mastectomy performed in the same year presented with bilateral lower limb pain suggestive of spinal pathology, and left chin numbness, both of 2 weeks' duration. Examination revealed left mandibular hypoesthesia without any other sign or symptoms. Orthopantomogram was unremarkable apart from mild alveolar bone expansion at tooth 36 area, which was extracted 3 months earlier. Subsequently, a full-body positron emission tomography contrast enhanced computer tomography revealed hypermetabolic lesions of her axial (excluding skull) and appendicular skeleton. In the head and neck region, left mandibular foramen and oropharynx bilaterally showed increased metabolism suggestive of tumour metastasis. The diagnosis was numb chin syndrome secondary to mandibular metastasis. Apart from supportive treatment, she was started on palliative chemotherapy and radiotherapy. At the time of discharge, there were no active complaints other than the aforementioned hypoesthesia.

BACKGROUND

Numb chin syndrome (NCS), although rare, is an important clinical finding. The consideration of malignancy as a differential diagnosis may help in early diagnosis and intervention that may affect disease prognosis.

CASE PRESENTATION

A 51-year-old Malay woman who was a known case of stage 2 left breast carcinoma in 2006 presented with left chin numbness of 2 weeks' duration. She previously underwent left mastectomy and breast reconstruction followed by adjuvant radiotherapy. She had sternal metastasis in 2015 and had undergone radiotherapy and letrozole therapy.

She presented with bilateral lower limb pain of 2 weeks' duration which was aggravated by sitting and lying down. She was also referred to the maxillofacial team for left chin numbness of 2 weeks' duration which was progressive, intermittent and associated with anterior chest wall pain. There was no toothache or mandible pain. On examination, all vital signs were normal. Extraoral examination revealed reduced sensations (touch and proprioception) at the left mandibular region with no obvious facial swelling or trismus. Intraoral examination was unremarkable with normal interincisal mouth

opening of more than 40 mm, good oral status and normal occlusion. Other systemic examinations were also without significant finding.

INVESTIGATIONS

Blood investigations

Full blood count: Haemoglobin (Hb) 13.9g/dL, white cell count $12.6 \times 10^9/L$, platelets $498 \times 10^9/L$.

Renal profile: Na 137 mmol/L, K 4.6 mmol/L, urea 4.7 mmol/L, creatinine $56.9 \mu\text{mol/L}$.

Liver profile: Protein 80 g/L, albumin 40 g/L, globulin 40 g/L, bilirubin $7.6 \mu\text{mol/L}$, alanine aminotransferase 17 U/L, ALP 90 U/L.

Fasting lipid profile: Cholesterol 6.25 mmol/L, low-density lipoprotein 3.97 mmol/L, triglyceride 1.24 mmol/L.

Bone profile: Ca 2.47 mmol/L, Mg 0.75 mmol/L, PO4 1.40 mmol/L.

Glucose profile: Fasting glucose 5.7 mmol/L, HbA1c 5.8%, C-peptide 715.2 pmol/L.

Coagulation profile: prothrombin time (PT) 13.2 s, activated partial thromboplastin time (aPTT) 41.0 s, international normalized ration (INR) 1.04.

Urinalysis: Specific gravity 1.025, protein 0.25 mg%, ketone negative, leucocytes 100 cells/field, red blood cell nil.

Overall, there was thrombocytosis and mild leucocytosis, suggestive of acute disease. Slight derangements in the coagulation profile were compatible with the patient's liver disease, although the other parameters of the liver profile were normal. She was also noted to have an incidental finding of increased T4.

Imaging

An orthopantomogram were unremarkable apart from heavily restored posterior dentition. The edentulous space at the 36 regions shows mild expansion of the alveolar bone. The trabecular pattern however was normal. Inadvertent findings

Figure 1 Unremarkable orthopantomogram apart from raised alveolar cortex of edentulous area 36.

To cite: Razak A, Goh BS, Rajaran JR, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-223586

Figure 2 Arrow showing cortical erosion at left mandibular foramen, in a coronal CT scan image. Mild expansion in the mandibular canal was also observed.

of asymptomatic radiopaque lesion was noted on the right mandible ([figure 1](#))

On plain CT neck, the left mandibular foramen was noted to be enlarged with cortical erosion. Mild expansion of mandibular canal was also observed ([figure 2](#)). Right mandibular lesion suggestive of cementoblastoma was confirmed with CT examination.

Figure 3 Arrow showing hypermetabolic region at left mandibular foramen in a positron emission tomography scan image.

PET-CECT showed numerous new hypermetabolic, mixed lytic–sclerotic lesions involving the axial, left mandibular foramen and appendicular skeleton. There was no locoregional tumour recurrence or nodal metastasis seen ([figure 3](#)).

DIFFERENTIAL DIAGNOSIS

Malignancy associated NCS.
Trigeminal nerve neuropathy.
Base of skull tumour.

TREATMENT

The patient was referred to the oncologist and was later started with tab exemestane 25 mg once daily. Tab losartan 50 mg once daily was continued, but she was taken off letrozole. A chemoport was inserted, with subsequent administration of monthly dose of zoledronic acid/denosumab and radiotherapy. Given the condition of her spine, she was also placed on a thoracolumbosacral orthotic. No active treatment was indicated for the mandibular hypoaesthesia.

OUTCOME AND FOLLOW-UP

On the discharge date, the patient was still having mandibular hypoaesthesia. She was otherwise ambulating well, with no neck stiffness or lower limb pain. She was scheduled for monthly follow-up.

DISCUSSION

NCS, or mental nerve neuropathy, refers to the unilateral hypoaesthesia, paraesthesia or pain over the region of chin supplied by the mental nerve or its branches.^{1–3} Causes for these include local malignancies and metastases to the jaw, both of which can result in inferior alveolar nerve compression or infiltration of its sheath. In light of the fact that this nerve has no motor fibres, the resulting deficit is purely sensory.¹

This syndrome is highly suggestive of metastasis to the oral cavity, although the pathology may sometimes be dental or systemic in origin.² In addition, NCS is an important indicator of the progression or relapse of insidious cancers.⁴ Pain is usually the initial symptom of oral metastases.²

Metastases of primary tumours to the oral cavity can be disastrous although these only account for 1% of all oral cancers.⁵ In fact, NCS without evident aetiology should be assumed to be caused by malignancies until proven otherwise.⁴ The main sources of malignant cells come from the breast (40.4%), lymph nodes (20.5) and prostate (6.6%) but pulmonary, renal, hepatic and colorectal cancers have also been reported to cause oral metastases and/or neurological deficits.^{6–8} It is noteworthy that our patient had a history of breast carcinoma over 10 years ago, although at an early stage. Overall, she was having a malignant invasion of the mandibular foramen; the absence of evidence of perioral infection could be attributed to her good oral hygiene.

Primary tumours of the prostate, breast and adrenal glands have a predilection for bones which are rich in red marrow, like the mandible. In further detail, mandibles of older people lack active marrows. However, this is not true for the posterior part of the bone and in teeth-deficient mandibles. Hence, as with the case of our patient, tumours which give rise to NCS are more likely to occur at the posterior part of the mandible vis-à-vis other parts of the bone or the maxilla. On another note, such metastases are also frequently found in postextraction sites. Two possibilities have been postulated regarding the same; the tumour could have been in place prior to extraction (as evidenced by localised pain, swelling and loosening of the tooth), or that

the process of extraction could have triggered the mechanisms responsible for metastasis.⁹

As such, metastases or primaries should be ruled out if a patient presents with facial paraesthesia, hypoesthesia or anaesthesia in the facial region, especially in patients with a history of malignancy. Other symptoms of the same include swelling, bleeding, paresis, facial distortion, pathological fractures, tooth mobility and restricted mouth opening.² While most case reports on NCS in context of breast cancer had facial paraesthesia or hypoesthesia as the only symptom,^{10 11} the simultaneous development of lower limb pain in our patient has allowed us to suspect metastases almost immediately.

In most cases with oral metastasis, palliative treatment is indicated. Early detection of oral lesions could improve treatment outcome and survival. A full diagnostic work-up is therefore of great importance.² Despite treatment, the average survival after diagnosis of mandibular metastasis is only 6–7 months.⁹

Orthopantomography is the most common initial investigation in case of suspected NCS. Ninety per cent of the cases will show osteolytic (moth-eaten) mandibular lesions. Sclerotic lesions may suggest the presence of a prostatic primary a sign which should be borne in mind by specialist fields which are largely confined to the oral cavity.¹² Alternatively, up to 5% of cases may not reveal any specific changes, which was true in our patient (figure 1).¹⁰ If the above-mentioned lesions are not seen, positron emission tomography (PET) CT is recommended as it can detect the microscopic involvement of the inferior alveolar nerve, hence allowing for early detection and treatment.² Indeed, PET-CT revealed hypermetabolic lesions at the patient's left mandibular foramen (figure 2), hypopharynx bilaterally and the sternum. Meanwhile, coronal CT scanning of the skull also showed the cortical invasion of the left mandibular foramen (figure 3). Both these investigation findings suggested the involvement of the inferior alveolar nerve which passes through the said foramen. A differential diagnosis for an ill-defined widening of the mandibular canal on imaging is lymphoma, although this finding is, by itself, rare.¹³ That being said, it is equally important to perform

the relevant investigations to detect the presence of systemic malignancies in NCS.⁴ Clinicians should also be mindful that normal anatomical variations and certain artefacts can give rise to misdiagnoses if radiographic investigations are done singly.¹⁴

Treatment-wise, surgery is advisable only if there is solitary oral metastasis.⁹ Otherwise, palliative approaches are usually adopted in light of widespread metastases in most cases of NCS. The main aims of palliative treatment are (1) to control pain via analgesics (eg, gabapentin, morphine), radiotherapy or chemotherapy and (2) to maintain a reasonable degree of oral functionality which may occasionally require surgery.⁶

Contributors AR, BSG, JRR and MNAJ have contributed to the design and implementation of the idea, to the analysis of the clinical findings and to the writing of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- Numb chin syndrome warrants proper attention as it is a sign of serious illness.
- Mandibular metastasis should not be overlooked in case of malignancies.
- Positron emission tomography scan and CT scan can be diagnostic modalities to confirm the diagnosis and the primary lesion.

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