Journal of Radiotherapy in Practice

Journal of Radiotherapy in Practice (2015)
14, 84–87 © Cambridge University Press 2014
doi:10.1017/S1460396914000302

Case Study

Small cell lung cancer metastatic to the submandibular gland

Talha Shaikh [1], Hormoz Ehya[2], Aruna Turaka[1]

[1]*Department of Radiation Oncology, Fox Chase Cancer Center, Philadelphia, PA, USA,* [2]*Department of Pathology, Fox Chase Cancer Center, Philadelphia, PA, USA*

(Received 24 April 2014; revised 8 July 2014; accepted 11 July 2014; first published online 4 August 2014)

Abstract

A 58-year Caucasian woman with a 45-pack year smoking history underwent a computed tomography (CT) scan of the chest due to a persistent respiratory infection. Imaging revealed extensive mediastinal and hilar lymphadenopathy on the right. Fine needle aspiration of the right paratracheal and subcarinal lymph nodes revealed small cell lung carcinoma. She was treated with definitive concurrent chemoradiation (with Cisplatin and Etoposide) therapy to the primary tumor and the mediastinum using intensity modulated radiation therapy. Post-treatment repeat CT of the chest showed complete radiographic response and she was offered prophylactic cranial irradiation which the patient refused. Within six months of completing treatment, the patient developed brain metastases and was treated with a course of palliative radiation to the whole brain. One month after completion, she noticed painful swelling of the left submandibular gland and a CT showed an enlarged submandibular gland. FNA revealed metastatic SCLC. She was treated with urgent palliative RT to the left submandibular gland with significant improvement in her symptoms.

Key words: small cell lung cancer; submandibular gland; palliative; whole brain radiation therapy

INTRODUCTION

Despite significant advancements in the management of small cell lung cancer (SCLC) the median overall survival remains poor. One of the main reasons for the poor prognosis is the strong likelihood of an advanced stage at the time of diagnosis. Approximately 70% of patients diagnosed with SCLC are found to have extensive disease. Median overall survival for untreated patients is only 6 weeks whereas patients who may have some form of multi-agent chemotherapy followed by prophylactic cranial irradiation (PCI) are still only likely to survive 5 to 7 months.

One of the factors that make SCLC particularly devastating is its propensity to metastasise. Approximately 60% of patients will have metastatic disease at the time of diagnosis. Most commonly the disease is found to metastasise to the liver, adrenals, bone and brain. Extrapulmonary neuroendocrine tumours are particularly rare and account for <1% of major salivary gland tumours.[1,2] In our review of the literature, only one case of SCLC metastatic to the submandibular gland has been discussed.[3] We present a case of metastatic SCLC treated in the modern era.

Correspondence to: Aruna Turaka, Department of Radiation Oncology, Fox Chase Cancer Center, 333 Cottman Avenue, Philadelphia, PA 19111, USA. Tel: 215 728 3022. Fax: 215 214 1629. E-mail: Aruna.Turaka@fccc.edu

CASE REPORT

History of present illness

A 58-year Caucasian woman with a 45 pack-year smoking history completed a course of antibiotics for a chronic cough without symptomatic relief. She also noted bilateral submandibular swelling that was confirmed on clinical examination by her primary care physician. A computed tomography (CT) scan of the chest done at that time showed extensive mediastinal and hilar lymphadenopathy on the right. The patient underwent an 18 fluorodeoxyglucose-based positron emission tomography scan that confirmed metabolically active lymph nodes in the right hilar and mediastinum along with a right middle lobe nodule. There was no evidence of increased activity in the submandibular glands at that time. Fine needle aspiration (FNA) of the right paratracheal and subcarinal lymph nodes revealed SCLC. Further work-up was negative for metastatic disease and she was diagnosed with limited stage SCLC (TNM Stage IIIA, T1aN2M0). Past medical history was significant for papillary thyroid cancer treated with thyroidectomy and radioiodine ablation 10 years ago.

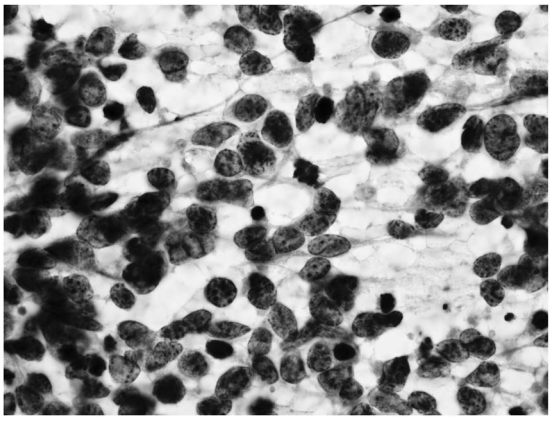

Figure 1. Photomicrograph of submandibular gland fine needle aspiration showing small tumour cells with high nuclear/cytoplasmic ratio, fine chromatin, nuclear moulding and invisible nucleoli. Apoptosis and high mitotic activity are evident (Papanicolaou stain).

Management

She was treated with definitive concurrent chemoradiation therapy (CRT) for the primary tumour and the mediastinum to a total dose of 6,020 cGy in 34 fractions over 6·5 weeks using intensity-modulated radiation therapy. She received one cycle of chemotherapy with Cisplatin and Etoposide before CRT and three additional cycles concurrent with radiation (total of four cycles). Post-treatment repeat CT of the chest

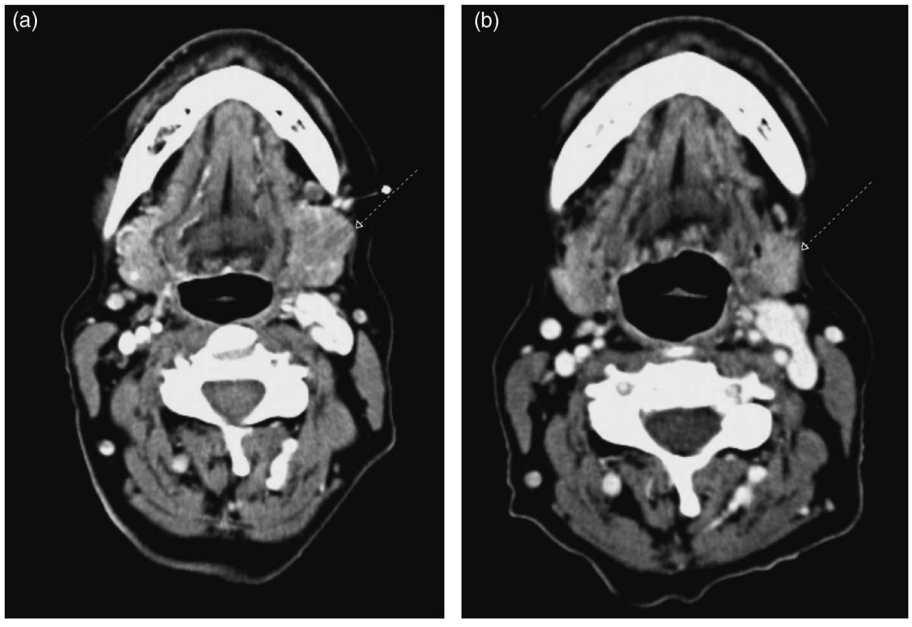

Figure 2. Pre-treatment (a) and post-treatment (b) imaging of submandibular gland.

https://doi.org/10.1017/S1460396914000302 Published online by Cambridge University Press

showed complete radiographic response and she was offered PCI, which the patient refused owing to concerns related to neurocognitive toxicity. Within 6 months of completing treatment, the patient developed multiple brain metastases and was treated with a course of palliative radiation to the whole brain (WBRT) to a dose of 3,000 cGy in ten fractions over 2 weeks. The patient was offered psychosocial support at this time but ultimately refused as she had a strong family support system.

Follow-up

One month after completion of WBRT, she noticed painful swelling of the left submandibular gland and a CT of the neck showed an enlarged $2{\cdot}1 \times 2{\cdot}3 \times 2{\cdot}0$ cm submandibular gland. FNA revealed metastatic SCLC (Figure 1). She was treated with urgent palliative RT to the left submandibular gland to a total dose of 3,000 cGy in ten fractions over 2 weeks duration with significant improvement in her symptoms. The patient was subsequently initiated on second line systemic therapy with Topotecan. An interval CT scan done 3 months later revealed significant regression in the size of her left submandibular gland mass that was now $\sim 1{\cdot}5 \times 1{\cdot}5 \times 1{\cdot}7$ cm (Figure 2). At last follow-up, 4 months after completion of treatment, she no longer had any submandibular gland pain, although she did have progression of disease in her brain and adrenal gland.

DISCUSSION

SCLCs rarely metastasise to the head and neck region particularly to the salivary glands with only a few case reports in the published literature. To our knowledge, this appears to be only the second case of SCLC metastatic to the submandibular gland, presented in the literature from a PubMed survey.[3] The only other report regarding SCLC metastatic to the submandibular gland details a patient in which this was the initial presentation of SCLC versus our report, which presents a case of distant spread. Owing to the rarity of this pattern of spread, there appears to be no reports in this area within the last 10 years. Almost 80% of metastatic tumours to the salivary glands arise from head and neck cutaneous malignancies, most commonly melanoma.[4] The parotid gland is more commonly seen as a site for salivary gland metastasis. Pisani et al.[5] reviewed the cases of parotid gland metastasis reported in the literature. Of 866 patients identified, only 2·8% developed metastatic disease from the lung although none of these cases were SCLC.[5] Van der Waal et al.[6] reviewed 1,537 cases of newly diagnosed oral cancer in the Netherlands and only found 24 cases of metastatic disease. Of these 24 cases, only 5 were from a lung primary, again without evidence of small cell histology.

The mechanism of metastatic disease to the head and neck remains unclear. Regional neoplasms such as cutaneous head and neck cancers are likely secondary to lymphatic spread. It has been postulated that haematologic dissemination is more common than lymphatic spread for infraclavicular primaries although both likely play a role.[7] Owing to the lack of lymph nodes in the submandibular gland, metastatic disease to this region is likely entirely haematogenous.

Diagnosing a patient with a submandibular gland enlargement can be challenging owing to a wide range of etiologies including non-neoplastic conditions, primary benign and malignant tumours, haematologic malignancies and metastatic neoplasms with important therapeutic implications. FNA is a rapid, minimally invasive and accurate method for providing a definitive diagnosis. Although rare, metastasis should be considered in the differential diagnosis of submandibular gland enlargement. In patients with a good performance status and localised disease, aggressive management likely remains the best treatment option to improve quality of life and prolong overall survival.

References

1. Pruckmayer M, Glaser C, Marosi C, Leitha T. Mandibular pain as the leading clinical symptom for metastatic disease: nine cases and review of the literature. Ann Oncol 1998; 9: 559–564.
2. Gnepp D R, Wick M R. Small cell carcinoma of the major salivary glands. An immunohistochemical study. Cancer 1990; 66: 185–192.
3. Brodsky G, Rabson A B. Metastasis to the submandibular gland as the initial presentation of small cell (oat cell) lung carcinoma. Oral Surg Oral Med Oral Pathol 1984; 58: 76–80.

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4. Batsakis J G, Bautina E. Metastases to major salivary glands. Ann Otol Rhinol Laryngol 1990; 99: 501–503.
5. Pisani P, Krengli M, Ramponi A, Pia F. Parotid metastases: a review of the literature and case reports. Acta Otorhinolaryngol Ital 1993; 12 (suppl 37): 1–28.
6. van der Waal R I, Buter J, van der Waal I. Oral metastases: report of 24 cases. Br J Oral Maxillofac Surg 2003; 41: 3–6.
7. Meyer I, Shklar G. Malignant tumors metastatic to mouth and jaws. Oral Surg Oral Med Oral Pathol 1965; 20: 350–362.

https://doi.org/10.1017/S1460396914000302 Published online by Cambridge University Press