Unusual metastases from papillary thyroid carcinoma

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Abstract
Papillary thyroid carcinoma is the most common type of well-differentiated thyroid carcinoma. Metastases usually occur in regional lymph nodes. Here, we report a patient with unusual metastases from papillary thyroid carcinoma. A 55-year-old woman had a history of right papillary thyroid carcinoma and underwent local excision of the right thyroid lobe in another hospital previously. The patient was found to have metastatic papillary thyroid carcinoma to the left parieto-occipital lobe, bilateral lung, left caput humeri, left triceps brachii muscle, right colhum ossis femoris and left thumb. She eventually suffered multiple organ failure and died. Therefore, if timely and thorough treatment is not provided, papillary thyroid carcinoma may become metastatic to brain, lungs, skeletal muscle, bones and other sites through direct haematogenic route.

Introduction
Papillary thyroid carcinoma is the most common type of well-differentiated thyroid malignancy and typically has an excellent prognosis and a low incidence of distant metastasis¹. Papillary thyroid carcinoma occasionally metastasizes to lungs and bones, but rarely to brain and skeletal muscle. We present an unusual case of metastases of papillary thyroid carcinoma to the left parieto-occipital lobe, bilateral lung, left caput humeri, left triceps brachii muscle, right colhum ossis femoris and left thumb.

Case report
A 55-year-old woman initially presented to our hospital in May 2006 with complaints of headache and transient loss of consciousness for 6 days. She had a history of right papillary thyroid carcinoma and underwent local excision of the right thyroid lobe in another hospital in 1992. Neck computed tomography (CT) (Figure 1a) showed post-operative changes of the right thyroid lobe, calcified nodule of the left thyroid lobe (arrow). Thyroid function test, including serum-free thyroxine, slightly fell to a level of 6.53 pmol/L (normal, 7.64–21.1 pmol/L), while serum levels of others were within the normal range. Brain CT (Figure 1b) showed a haemorrhagic mass with an inhomogeneous density measuring 5.0 × 3.0 cm in the left parieto-occipital lobe compressing posterior horn of the left lateral ventricle and crossing the midline to the right hemisphere (arrow). Chest CT (Figure 1c) showed bilateral multiple pulmonary metastases, the largest measuring 3.0 × 3.0 cm in the right lower lobe (arrow). The patient underwent total excision of the left parieto-occipital lobe tumour that showed metastasis from papillary thyroid carcinoma (Figure 2a), followed by external beam radiation for intracranial lesion and pulmonary metastases.

The patient was not periodically followed up after discharge and she did not visit the hospital until September 2006; she was readmitted with a mass in her left upper arm for 20 days. CT of the left upper arm showed local area of bone destroyed by metastasis measuring 3.0 × 2.0 × 2.0 cm in its dimension with a clear boundary (white arrow) and its internal soft-tissue mass shadow (black arrow) with uniform density in the left caput humeri (Figure 1d), and a low-density mass shadow measuring 2.8 × 3.4 cm in maximum diameter with unclear boundary and non-uniform density (arrow) in the long head of the triceps brachii muscle (Figure 1e). Ultrasonography of the left upper arm (Figure 1f) showed two adjacent hypoechic nodules measuring 3.0 × 1.9 cm and 3.1 × 1.9 cm in the muscle layer (arrow), in which internal echo was uneven, internal irregular echo-free zone was visible, the border was unclear and the envelope was not obvious. Colour Doppler ultrasonography showed scarce internal blood flow with peripheral ring of flow. The patient subsequently underwent excision of the mass in the left triceps brachii muscle, which revealed metastases from papillary thyroid carcinoma (Figure 2b). However, the patient refused total thyroidectomy and further ¹³¹I therapy, and she was discharged from the hospital.

Unfortunately, in October 2006, she was readmitted for 7 days with complaints of right hip pain and difficulty in walking. Hip CT (Figure 1g) showed osteolytic bone destruction and partial fracture of cortical bone in the right caput ossis femoris and colhum ossis femoris (arrow) with peripheral soft-tissue swelling. Because
Case report

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Discussion

Papillary thyroid carcinoma is the most common differentiated thyroid carcinoma and typically has an excellent prognosis. Metastases commonly occur in regional lymph nodes. Distant metastases are generally associated with a follicular carcinoma histology rather than papillary thyroid carcinoma. The most common sites for distant metastases of papillary thyroid carcinoma are the lungs and bones, and rarely the brain, skeletal muscle and other sites. Distant metastases from papillary thyroid carcinoma are associated with poor prognosis.

To the best of our knowledge, this is the first case to be reported in the literature showing unusual metastases of papillary thyroid carcinoma to the left parieto-occipital lobe, bilateral lung, left caput humeri, left triceps brachii muscle, right collum ossis femoris and left thumb. Therefore, if timely and thorough treatment (which may include radical surgical resection and radioiodine therapy) is not provided, papillary thyroid carcinoma may become metastatic to the brain, lungs, skeletal muscle, bones and other sites through direct haematogenic route. This case also highlights the importance of a periodic follow-up of the patient with unusual metastases from papillary thyroid carcinoma.

Figure 1: (a) Neck CT shows post-operative changes of the right thyroid lobe, calcified nodule of the left thyroid lobe (arrow). (b) Brain CT shows a haemorrhagic mass with an inhomogeneous density measuring 5.0 × 3.0 cm in the left parieto-occipital lobe compressing posterior horn of the left lateral ventricle and crossing the midline to the right hemisphere (arrow). (c) Chest CT shows bilateral multiple pulmonary metastases, the largest measuring 3.0 × 3.0 cm in the right lower lobe (arrow). (d) CT of the left upper arm shows local area of bone destroyed by metastasis measuring 3.0 × 2.0 × 2.0 cm in its dimension with clear boundary (white arrow) and its internal soft-tissue mass shadow (black arrow) with uniform density in the left caput humeri. (e) CT of the left upper arm shows a low-density mass shadow measuring 2.8 × 3.4 cm in maximum diameter with unclear boundary and non-uniform density (arrow) in the long head of the triceps brachii muscle. (f) Ultrasonography of the left upper arm shows two adjacent hypoechoic nodules measuring 3.0 × 1.8 cm and 3.1 × 1.9 cm in the muscle layer (arrow), in which internal echo was uneven, internal irregular echo-free zone was visible, the border was unclear and the envelope was not obvious. Colour Doppler ultrasonography shows scarce internal blood flow with peripheral ring of flow. (g) Hip CT shows osteolytic bone destruction and partial fracture of cortical bone in the right caput ossis femoris and collum ossis femoris (arrow) with peripheral soft-tissue swelling. (h) An X-ray of left thumb, which shows internal soft-tissue mass shadow with unclear boundary and most destruction and disappearance of phalanx distalis with rough edge (arrow).
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