

# Late Metastases of Brain and Skull From Papillary Thyroid Carcinoma: A Case Report

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✓ Brain metastases from papillary thyroid carcinoma (PTC) are extremely rare entities. Distant metastases are rare and usually occur in advanced stages of the disease. Such type of metastases almost always develop synchronously, particularly in the lungs, bones and thoracic lymph nodes. In this condition, poor prognosis has been shown and tumor behavior is more aggressive. We present a case of papillary thyroid carcinoma (PTC) with late skull and brain metastases emerged 20 years after the primary disease. The patient is a 57-year-old woman who presented with urinary incontinence, left hemiparesia, and memory loss. The patient had undergone surgery in 1987 for thyroid malignancy, and three operations for an intracranial meningioma in 1988, 1992 and 1995. Therefore, a computed tomography (CT) and magnetic resonance imaging (MRI) were performed on the patient. CT and MRI revealed two masses located on the right and left frontal poles. The patient underwent total excision of the recurrent intracranial meningioma, but histopathologic diagnosis was determined as PTC. Patient was treated with radioactive iodine 131 following craniocervical surgery.

**Key words:** Papillary thyroid carcinoma, Late metastase, distand metastase, skull and brain metastase

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## Papiller Tiroit Kanserinin Kafatası ve Beyne Geç Metastazı: Vaka Raporu

✓ Papiller tiroit kanserinden (PTC) kaynaklanan beyin metastazları çok ender görülür. Uzak metastazlar çok enderdir ve genellikle hastalığın ileri safhalarında görülürler. Bu tip metastazlar neredeyse daima eş zamanlı olarak akciğerleri, kemikleri ve mediastinal lenf bezlerini tutarlar. Bu şartlarda zayıf prognoz gözlenirken tümör davranışı daha saldırgancaştır. Primer hastalığın başlangıcından 22 yıl sonra geç kafatası ve beyin metastazına sahip bir papiller tiroit kanseri (PTC) vakasını sunuyoruz. Elli yedi yaşında kadın hasta idrar inkontinansı, sol hemiparezi ve hafıza kaybı ile başvurdu. Hastanın özgeçmişinde, 1987'de tiroit malignitesi ve 1988, 1992 ve 1995 yıllarında olmak üzere üç defa da kranial menenjiyom operasyonu geçirdiği öğrenildi. Bu yüzden hastamıza bilgisayarlı tomografi (CT) ve MRI çekildi. CT ve MRI sağ ve sol frontal lopta iki adet kitle lezyonunu ortaya çıkardı. Hasta nüks intrakranial menenjiyom nedeniyle total kitle çıkarımı için ameliyat edildi, fakat histopatolojik tanı PTC olarak belirlendi. Hasta baş-boyun cerrahi tedavisi sonrası radyoaktif iyot 131 ile tedavi edildi.

**Anahtar kelimeler:** Papiller tiroit karsinomu, geç metastaz, uzak metastaz, kafatası ve beyin metastazı

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**P**apillary thyroid carcinomas (PTC) are the most common type of thyroid cancers, and prophylactic lymph node dissection

(LND) has demonstrated that this carcinoma frequently metastasizes to regional lymph nodes (5,10). It shows a mild biological behavior with a

good prognosis. The first manifestation of PTC is usually a thyroid nodule or a neck mass, and less frequently metastases into the regional lymph nodes<sup>(8)</sup>. Distant metastases are rare and usually occur in the advanced stages of the disease, especially in the lungs, bones and thoracic lymph nodes<sup>(7)</sup>. Brain metastases suggest an aggressive disease and a poor prognosis<sup>(13)</sup>. Though brain metastasis is extremely rare, they might indicate the initial metastatic site. Early diagnosis of distant metastasis of PTC might save the patient's life and prolong survival.

We report a rare case of papillary thyroid carcinoma in its late stage with distant metastases to the brain and skull. Since the history of the patient revealed three cranial operations because of meningioma, a recurrent meningioma was suspected. The metastatic bifrontal mass was totally excised.

#### CASE REPORT

In January 2009, a previously well 57-year-old woman presented with one-month history of progressive short term memory loss, urinary

incontinence and ataxia. She had no other neurological complaint. Clinical examination revealed left hemiparesia, left amoretic eye and optic atrophy on funduscopy. MRI showed a right frontal contrast-enhanced (4x5x5 cm) and a left frontal tumor (1x1x1 cm). T1-weighted axial section with contrast (Figure 1a) and axial T2 section of the brain MRI (Figure 1b) revealed the tumor mass within frontal lobes. The tumor enhanced brightly with contrast and showed midline shift.

The patient underwent a bifrontal craniotomy and total excision of the tumor under the guidance of the neuronavigation apparatus (BrainLab Vector vision2, Munich, Germany). The left hemiparesia, and memory loss recovered rapidly. Histopathology of the specimen revealed PTC (Figure 2). After pathological diagnosis, the skull, lungs and other metastatic sites were investigated carefully. For screening bone metastasis, whole bone scintigraphy was performed which revealed an increased uptake of 20mCi Tc-99m MDP in the left temporoparietal bone, bilateral supraorbital frontal bone, surrounding foramen magnum encircled bone, cervical 1 and

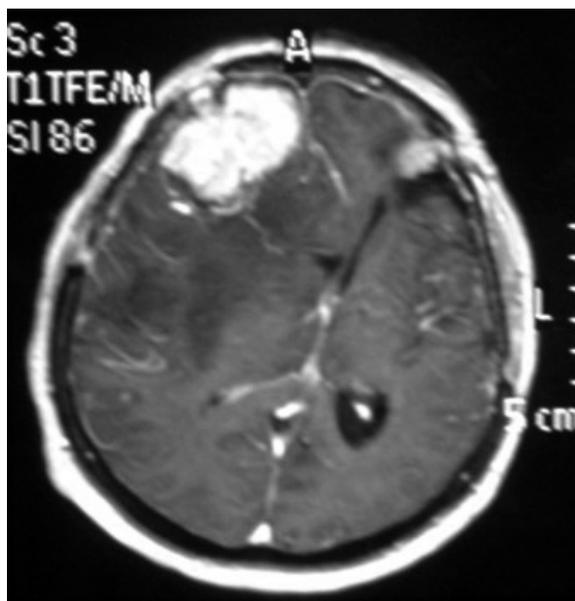


Figure 1a.

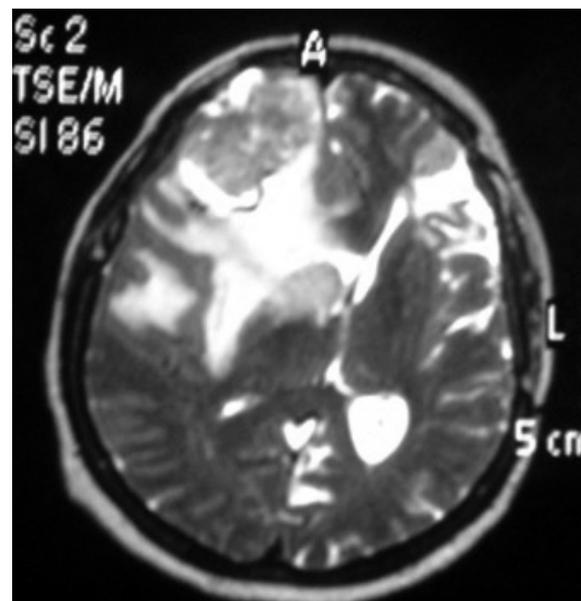


Figure 1b.

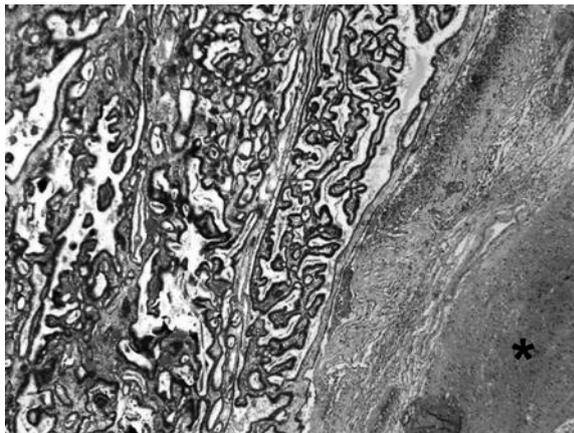


Figure 2.

2 vertebra and left acetabular angle, left proximal portion of the left femur, right acetabular angle (skeleton), and proximal 2/3 portion of the right femur (Figure 3). Thorax and abdominal CT were performed but no evidence of metastasis was detected. Ultrasonography of the thyroid revealed multiple nodules over the right lobe of the thyroid, and since cervical lymphatic nodes were not involved from the disease, the left lobe had totally resected. Thyroid scintigraphy could not be performed because of TSH suppression. After establishment of the histopathologic diagnosis of the patient, levels of serum thyroxine, triiodothyronine, TSH, thyroglobulin and antithyroglobulin antibody were found to be 5.4 ng/dL, 2.13 ng/mL, 0.03  $\mu$ IU/mL and 242.22 ng/ml, and 1251.45 IU/ml, respectively.

Two months later, she underwent right lobe thyroidectomy and received radioactive iodine therapy. Histopathology of the thyroid gland confirmed primary papillary carcinoma in the right lobe. She still has no residual intracranial tumor since the initial operation.

## DISCUSSION

PTC is the most common thyroid malignancy, and prophylactic lymph node dissection (LND) has demonstrated that this carcinoma frequently and easily metastasizes to regional lymph nodes

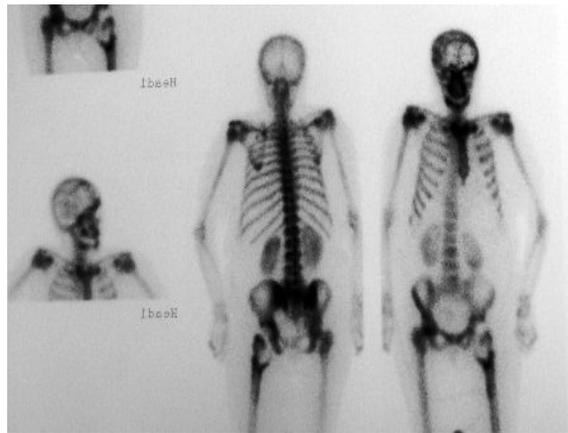


Figure 3.

(7). Papillary thyroid carcinomas (PTC) usually have a less severe clinical course which behaves unlike other thyroid carcinomas. Distant metastases are rare, furthermore, brain metastases are extremely rare and few reports have been published in the literature. The rate of brain metastases in the literature ranges between 0.4 % and 1.5 % (Biswal et al 1.25 %, Carcangiu et al 0.4 %, Chiu et al 1.5 %, Hijyanakis et al 0.9 %, Hoie et al 1.2 % and Mc Conahey et al 1.3 %) (2,4,6,7,11). However, controversy remains concerning the clinical importance of lymph node metastasis (LNM) in patients with PTC (16). LNM has been shown to be an indicator of occult or subsequent distant metastases in different studies (5,10,15-17). If from primary PTC distant metastases develop, then prognosis of the disease is worse (2,13). Thus, the results of LNM can be used to predict the outcome. In particular, lymphadenopathy is considered to have a significant impact on outcomes. Wada et al (16) investigated the potential effect of lymphadenopathy on prognosis and revealed a high incidence of microscopically involved lymph nodes without palpable lymphadenopathy (PLA). In addition, the authors stated that younger patients have a favorable prognosis even when they present with palpable lymphadenopathy (PLA), whereas older patients who present with PLA appear to have a worse prognosis. In their study, they showed patients' age and PLA were

significant risk factors. Clinical outcomes are worse in older patients with PLA, and such patients should be treated carefully with a well planned treatment strategy, whereas younger patients without PLA have a favorable prognosis<sup>(16)</sup>. Patients with brain metastasis have always shown other concomitant metastatic sites such as bones, lung, liver or pancreas<sup>(1,9,12,14)</sup>.

The present case showed neurological symptoms. The history of the patient revealed three brain operations because of meningiomas. Therefore, the brain lesions had suggested a meningioma. In addition, the patient's radiological findings mimicked meningioma on MRI. Therefore, the patient was operated on without searching for the origin of metastases. Primary focus and other distant metastases were investigated following the histopathological diagnosis. However, the patient's life had been saved by the total excision of the tumor.

## CONCLUSION

We understood from this case that although skull and brain metastases of PTC are extremely rare, early detection and the correct treatment protocol can lead to prolonged survival. Otherwise these distant metastases generally have a poor prognosis. The fact that the patient might have a concomitant different pathology must be taken into consideration.

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