Solitary Metastasis From Occult Follicular Carcinoma of the Thyroid Mimicking Trigeminal Neurinoma

—Case Report—

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Abstract

A 50-year-old woman presented with an extremely uncommon case of solitary metastasis from follicular carcinoma of the thyroid, which presented clinically as trigeminal neurinoma. Neuroimaging detected a tumor in the right petrous apex, which was removed surgically. Histological examination showed metastatic follicular carcinoma of the thyroid. However, no primary tumor was detected by various investigations. The tumor recurred twice, and was treated surgically both times. The patient finally agreed to adjuvant therapy for the suspected primary. Radiotherapy was performed followed by complete thyroidectomy. Examination of the gross specimen found the tumor nodule. Clinically significant metastasis can arise from histologically benign and silent follicular thyroid neoplasms.

Key words: intracranial metastases, follicular carcinoma of thyroid, trigeminal neurinoma

Introduction

Metastatic tumors involving the trigeminal nerves or gangliaons are uncommon. Solitary metastasis to the trigeminal nerve/ganglion from carcinoma of breast,8,9) lung,3,5) lymphoma,3,9,10) and colorectal adenocarcinoma10) have been reported. However, metastases to the trigeminal ganglion and nerve from follicular carcinoma of the thyroid are extremely uncommon. We report here a very rare case of solitary metastasis from follicular carcinoma of the thyroid mimicking a trigeminal neurinoma clinically. Despite the metastatic nature, the disease had a relatively benign course in this patient.

Case Report

A 50-year-old woman presented in July 1992 with a 5-year history of intermittent, bifrontal headache. She had suffered insidious onset of paresthesia over the right half of the face for the past 2 years, together with a squint in the right eye and diplopia with horizontal separation of the images. In the past year, she had developed facial asymmetry and diminished taste sensation on the right half of the tongue. She also had tinnitus in the right ear for 5 months.

Neurological examination found she was conscious and alert. She had right trigeminal sensory loss of 50–75% with motor involvement, right abducens and facial nerve pareses, and sensory-neural hearing loss in the right ear. No other neurological abnormalities were found. Routine biochemical and hematological parameters were within normal limits. Computed tomography (CT) showed a mixed density lesion in right petrous apex, which was enhanced after contrast administration (Fig. 1). Bone window CT confirmed destruction of the petrous apex and clivus. Under a probable diagnosis of trigeminal schwannoma/Meckel’s cave meningioma, surgery was performed through a right subtemporal extradural approach on July 17, 1992.

The encapsulated tumor was soft and vascular, arising in Meckel’s cave and involving lateral wall of the cavernous sinus. The petrous apex was completely eroded. The tumor had infiltrated the rootlets of the trigeminal nerve. The postoperative course was uneventful. Her preoperative neurological deficits persisted. Histological examination showed
Fig. 1 Axial computed tomography scan with contrast medium, showing an enhanced tumor in the region of the right petrous apex (arrow).

Fig. 2 Photomicrograph showing the features of follicular carcinoma of the thyroid. Some of the follicles contain eosinophilic colloid-like material. HE stain, ×200.

Fig. 3 Axial magnetic resonance image, showing a highly enhanced tumor in the region of the right Meckel's cave and extending into the cavernous sinus.

numerous glandular and acinar structures. The acini contained deeply eosinophilic acellular colloid-like material lined by cuboidal cells. The acini and glands were intersected by solid islands of cells with vesicular nuclei and surrounded by pale abundant cytoplasm. These features were interpreted as metastatic follicular carcinoma of the thyroid (Fig. 2). The presence of primary lesion in the thyroid was investigated. Clinical examination did not reveal any mass in the thyroid. Ultrasonography of the thyroid found no abnormality. Fine needle aspiration cytology (FNAC) of the thyroid detected no malignant cells. The patient refused for another major surgical procedure for total thyroidectomy.

Two years later, she again presented with recurrent symptoms which were progressive. CT showed tumor recurrence in the same anatomical location. Magnetic resonance imaging showed an isointense lesion on T1- and T2-weighted images, which was highly enhanced after gadolinium administration (Fig. 3). The lesion was centered on the petrous apex, extending into the posterior cavernous sinus and posteriorly in the cerebellopontine angle. Cerebral angiography showed dense tumor blush, supplied by branches from the external carotid artery and tentorial branches of the cavernous carotid artery. The petrous portion of the carotid artery was replaced anteriorly and the proximal genu of cavernous internal carotid artery was displaced anteromedially. Re-exploration through right temporal craniotomy with zygomatic osteotomy via an extradural approach achieved near total excision of the tumor on September 24, 1996. The tumor was grayish white, firm, non-suckable, and extremely vascular. The postoperative period was uneventful. She had persistent cranial nerve deficits as before. The histological diagnosis was again established as metastatic follicular carcinoma. She was advised to undergo total
thyroidectomy and radioiodine ablation, but she refused the treatment.

About one year later, she again presented with intractable facial pain. CT revealed recurrent tumor with a slightly larger posterior fossa component causing brain stem compression. Surgery via a retrosigmoid craniectomy could only achieve partial excision of the tumor due to extreme vascularity on January 9, 1998. The patient agreed to adjuvant treatment. She was referred to a regional cancer center where whole brain radiation therapy (WBRT) followed by total thyroidectomy and radioiodine ablation of the intracranial metastasis was planned. 131I-labeled 99mTc bone scintigraphy showed a cold area in the right petrous apex region. Serum alkaline phosphatase levels were mildly raised (477 U/l). Serum thyroglobulin level was also elevated (305.0 ng/ml). Ultrasonography of the thyroid and abdomen found no abnormalities. Patient underwent 35 Gy WBRT with a local boost of 20 Gy. Three months later, she underwent total thyroidectomy. Gross examination revealed a firm nodule of 1.5 × 1.0 cm size in the right lobe of thyroid, but the left lobe of the thyroid appeared normal. Histological examination showed an encapsulated neoplasm, composed of cells arranged in nests and sheets, with eosinophilic cytoplasm and round to oval hyperchromatic vesicular nuclei. There was hyalinization of the stroma and neoplastic infiltration of the capsule. Sections from the left lobe of the thyroid showed follicles of varying sizes lined by flattened to cuboidal cells. These features were interpreted as carcinoma of the thyroid, follicular/papillary type. Therefore, local radiotherapy of 45 Gy was given to the neck. She was in good health with persistent neurological deficits at follow up after 6 months on January 21, 1999. CT showed a tumor in the petrous apex region with a small posterior fossa component, showing central hypodensity. 131I dynamic scintigraphy showed 0.5% uptake in the region of petrous apex on July 30, 1999. Unfortunately, 2 months later she was admitted to a local hospital after a massive stroke and died.

Discussion

Intracranial metastases from an extracranial primary carcinoma commonly involve the brain parenchyma, dura, and leptomeninges. Cranial nerve involvement is uncommon, and involvement of the trigeminal nerve/ganglion by metastatic tumors is extremely rare, with only 26 documented cases. Trigeminal nerve/ganglion involvement is a recognized manifestation of metastasis from primary tumors of the neck and nasopharynx. Metastases from breast carcinoma to the trigeminal nerve have been reported. In the majority of these cases, the mononeuropathy was not caused by direct metastasis to the affected nerve but was secondary to diffuse metastasis to the leptomeninges, dura mater, or cavernous sinus. Trigeminal mononeuropathy caused by neoplastic lesions is associated mainly with trigeminal schwannoma and tumors arising from the cerebellopontine angle, invasive tumors of the neck and nasopharynx, and meningeal involvement by leukemia or carcinomatosis. Such neuropathy usually occurs concomitantly with other cranial nerve pareses and develops as a result of direct invasion or compression of the trigeminal nerve or ganglion by the tumor. Previously, 22 patients have been reported in whom the first clinical symptom of intracranial metastasis was trigeminal mononeuropathy. However, all 22 patients had diffuse tumor metastases in the brain or meningeal infiltration which was detected during postmortem examination. Isolated metastasis to the trigeminal nerve or ganglion by a hematogenous route from a distant, solid tumor is extremely rare. Two cases each of breast carcinoma, lung carcinoma, and lymphoma metastasis have been reported. One case of metastasis to Meckel’s cave from colorectal adenocarcinoma has also been reported. The present case was metastatic carcinoma with occult primary causing trigeminal neuropathy, first presenting as distant intracranial metastasis mimicking trigeminal neurinoma. The initial presentation was trigeminal mononeuropathy, but subsequently other cranial nerves were involved as a result of the mass effect. Based on the histological findings, extensive work up for thyroid malignancy was performed. However, all available investigations including thyroid ultrasonography and FNAC could not locate the primary. The specimen from total thyroidectomy confirmed a small tumor in the right lobe of the thyroid which had remained silent. Histological examination of the specimen confirmed follicular carcinoma of the thyroid.

Metastatic follicular carcinoma has been reported masquerading as chordoma. The metastatic pathways through which malignant tumors can involve the trigeminal nerve or ganglion can be divided into three groups: Subarachnoid dissemination, hematogenous dissemination from extracranial malignancy, and direct retrograde intracranial extension from nasopharyngeal tumors. The metastatic route in this case is considered to have been hematogenous. The disease course remained relatively benign, even after presenting as metastatic carcinoma. This finding emphasizes that clinically significant metastases can arise from occult follicular carcinoma.
lar thyroid neoplasms that, according to standard histological criteria, are benign.

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References


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