Thyroid carcinoma intracranial metastases

From 10 institutions participating in the International Radiosurgery Research Foundation, we pooled patients with established papillary or follicular thyroid cancer diagnosis who underwent SRS for histologically confirmed or radiologically suspected BMs. We investigated patient overall survival (OS), local tumor control, and adverse radiation events (AREs). Results: We studied 42 (52% men) patients who underwent SRS for 122 papillary (83%) or follicular (17%) thyroid cancer BMs. The mean age at SRS was 59.86 ± 12.69 years. The mean latency from thyroid cancer diagnosis to SRS for BMs was 89.05 ± 105.49 months. The median number of BMs per patient was 2 (range: 1-10 BMs). The median SRS treatment volume was 0.79 cm3 (range: 0.003-38.18 cm3), and the median SRS prescription dose was 20 Gy (range: 8-24 Gy). The median survival after SRS for BMs was 14 months (range: 3-58 months). The OS was significantly shorter in patients harboring ≥2 BMs, when compared with patients with one BM (Log-rank = 5.452, p = 0.02). Two or more BMs (odds ratio [OR] = 3.688; confidence interval [CI]: 1.143-11.904; p = 0.03) and lower Karnofsky performance score at the time of SRS (OR = 0.807; CI: 0.689-0.945; p = 0.008) were associated with shorter OS. During post-SRS imaging follow-up of 25.21 ± 30.49 months, local failure (progression and/or radiation necrosis) of BMs treated with SRS was documented in five (4%) BMs at 7.2 ± 7.3 months after the SRS. At the last imaging follow-up, the majority of patients with available imaging data had stable intracranial disease (33%) or achieved complete (26%) or partial (24%) response. There were no clinical AREs. Post-SRS peritumoral T2/fluid attenuated inversion recovery signal hyperintensity was noted in 7% BMs. Conclusion: The SRS allows durable local control of papillary and follicular thyroid cancer BMs in the vast majority of patients. Higher number of BMs and worse functional status at the time of SRS are associated with shorter OS in patients with thyroid cancer BMs. The SRS is safe and is associated with a low risk of AREs [1)]

As advanced therapies allow cancer patients to live longer, disease failure in the central nervous system increases from limited therapeutic penetration. Primary thyroid malignancies rarely metastasize to the brain and have a small number of investigations in the literature on the subject. The majority of brain metastases involve the brain parenchyma, reflecting the mass and blood distribution within the brain and central nervous system. Here, we report two cases of the most common differentiated thyroid cancers; follicular thyroid carcinoma having brain involvement from extra-axial growth and papillary thyroid carcinoma having brain involvement from a single intraventricular metastases, presumed as a metastases from the vascular choroid plexus. Both of our cases had widespread systemic involvement. For our follicular thyroid cancer, brain involvement was a result of extra-axial growth from calvarial bone, and our papillary thyroid cancer had brain involvement from a single intraventricular metastases that was initially resected and nearly a year later developed extensive brain involvement. Unlike the usual gray-white junction metastases seen in the majority of metastatic brain tumors, including thyroid, our cases are uncommon. They reflect differences in tumor biology that allows for spread and growth in the brain. Although there is growing genetic knowledge on tumors that favor brain metastases, little is known about tumors that rarely involve the brain [2)].

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Bunevicius A, Fribance S, Pikis S, Lee JYK, Buch LY, Moran M, Yang AI, Bernstein K, Mathieu D, Perron R, Liscak R, Simonova G, Patel S, Trifiletti DM, Martínez Álvarez R, Martínez Moreno N, Lee CC, Yang HC, Strickland BA, Zada G, Chang EL, Kondziolka D, Sheehan J. Stereotactic Radiosurgery for Differentiated Thyroid Cancer Brain Metastases: An International, Multicenter Study. Thyroid. 2021

May 11. doi: 10.1089/thy.2020.0947. Epub ahead of print. PMID: 33978475.

2)

Heery CR, Engelhard HH, Slavin KV, Michals EA, Villano JL. Unusual CNS presentation of thyroid cancer. Clin Neurol Neurosurg. 2012 Sep;114(7):1107-9. doi: 10.1016/j.clineuro.2012.01.004. Epub 2012 Jan 31. PubMed PMID: 22296651.