

The Role of Radiotherapy in Skull Metastasis of Thyroid Follicular Carcinoma

Úloha radioterapie při metastázách lebky u folikulárního karcinomu štítné žlázy

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Summary

Introduction: Bone metastasis is seen in 2.3–12.7% of thyroid follicular carcinomas. Bone metastasis most commonly occurs in the vertebrae, costas and hip bones. In this report we discuss the diagnosis and treatment of a patient followed up due to skull metastasis of thyroid follicular carcinoma in light of literature. **Case report:** A 51-year-old female patient underwent surgery due a mass in the scalp. The histopathological examination was reported as metastasis of follicular thyroid carcinoma. No radiotherapy was indicated because of the total excision of the mass and the benign surgical margins. The patient, in whom fine needle aspiration biopsy showed the result of follicular carcinoma underwent a total bilateral thyroidectomy. Whole-body I-131 scintigraphy revealed diffuse activity involvement in the thyroid gland, and lung and bone (skull, sacrum, right acetabulum) metastasis. The patient was scheduled for radioactive iodine therapy. **Conclusion:** Total/near total thyroidectomy and metastasectomy should be the treatment of choice in skull metastasis. Postoperative radioactive iodine and radiotherapy should be offered. Radiotherapy should be reserved for inoperable and residual tumour cases.

Key words

thyroid follicular carcinoma – radiotherapy – skull metastasis

Souhrn

Úvod: U folikulárního karcinomu štítné žlázy jsou kostní metastázy pozorovány ve 2,3–12,7 % případů. Nejčastěji se kostní metastázy vyskytují v obratlích, žebrech a pánevních kostech. V tomto článku s ohledem na dostupnou literaturu diskutujeme diagnózu a léčbu pacientky sledované pro metastázu v lebce u folikulárního karcinomu štítné žlázy. **Kazuistika:** Pacientka ve věku 51 let byla operována kvůli útvaru v pokožce hlavy. Výsledky histopatologického vyšetření ukázaly na metastázu folikulárního karcinomu štítné žlázy. Vzhledem k úplné excizi nádoru a benigním chirurgickým okrajům nebyla indikována radioterapie. Aspirační biopsie tenkou jehlou u pacientky prokázala folikulární karcinom štítné žlázy a pacientka podstoupila totální bilaterální tyreoidektomii. Celotělová scintigrafie provedená pomocí jodu I-131 odhalila difúzní aktivitu ve štítné žláze a metastázy v plicích a kostech (lebka, kost křížová, kloubní jamka pravého kyčelního kloubu). Pacientce byla naplánována léčba radiojodem. **Závěr:** Léčbou volby by v případě lebečních metastáz měla být totální / téměř totální tyreoidektomie a metastazektomie. Měla by být nabídnuta pooperační léčba radiojodem a radioterapie, přičemž radioterapie by měla být vyhrazena pro případy neoperovatelných a zbytkových nádorů.

Klíčová slova

folikulární karcinom štítné žlázy – radioterapie – lebeční metastázy

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Introduction

Follicular thyroid carcinoma (FTC) accounts for 17% of all thyroid malignancies. Distant metastasis is reported in 4.5–15% in FTC [1]. It is often hematogenous. The most common metastasis occurs in the lungs, bones and liver [1,2]. Bone metastasis is not frequent in FTC with an incidence between 2.3% and 12.7%. Among bone metastases, skull metastasis is extremely rare [2,3]. The primary treatment of skull metastasis is surgery. Radiotherapy and radioactive iodine therapy are recommended for inoperable patients and residual tumours [1–4].

In this article, we discuss the clinical findings, imaging characteristics, the treatments administered and the prognosis of a patient followed up due to FTC, in light of literature.

Case report

A 51-year-old female patient was referred to the neurosurgery outpatient clinic with complaints of increasing swelling and pain in the scalp. The physical examination revealed a hard and immobile mass lesion of 4 × 4 cm in the parietal region at the level of the vertex. The patient had no known history of systemic disease. She had no history of smoking or alcohol abuse. Cranial computed tomography and magnetic resonance imaging showed an extra-axial lo-

calised mass lesion of 42 × 45 mm, which caused destruction in the bony structure in the right parietal and parasagittal areas, extending toward the superior and showing diffuse heterogeneous contrast enhancement on the postcontrast series (Fig. 1). Total excisional biopsy was performed. The pathological outcome was reported as follicular carcinoma metastasis. Radiotherapy was not indicated because of the benign surgical margins and total excision of the mass. On the neck and thyroid ultrasound of the patient, a multinodular heterogeneous thyroid gland was observed. The patient, in whom fine needle aspiration was reported as follicular carcinoma underwent a total bilateral thyroidectomy. Whole-body I-131 scintigraphy revealed diffuse activity involvement in the thyroid gland, and lung and bone (skull, sacrum, right acetabulum) metastasis. The patient was scheduled for radioactive iodine therapy.

Discussion

Bone metastasis most commonly occurs in the vertebrae, costas and hip bones. Skull metastasis is extremely rare [1]. In a study by Nagamine et al. of 473 patients with thyroid cancer, skull metastasis was reported at 2.5% [2]. Anatomically, the lesions are more common in the middle line frontal and parietooccipital regions. Radiologically, the majority

of the lesions seen in the scalp are typically single, hypervascular and osteolytic. The most common symptom is cranial nerve dysfunction [3,4].

The primary treatment of skull metastasis is surgery [4,5]. Studies have shown that the resection of skull metastasis in addition to total thyroidectomy increases survival [1]. Radioactive iodine and radiotherapy are applied for unresectable or residual tumours [2,5]. Besides, monoclonal antibodies targeting RANKL and bisphosphonates play an important role in the treatment of bone metastases of thyroid cancer [6]. Kotecha et al. reported that Gamma Knife surgery is an efficient treatment method in the calvarium bones and skull base metastases [7]. Screening the literature, timing a dose of the radiotherapy to be given, and the subgroup which will benefit from stereotactic radiosurgery have yet to be clarified. Vascular endothelial growth factor-specific receptor tyrosine kinase inhibitors have been shown to be useful in cases refractory to radioactive iodine therapy [8]. External-beam radiotherapy is recommended to improve locoregional control in cases resistant to radioactive iodine treatment [9]. The mean survival was reported as 4.5 years (5 months – 17 years) in thyroid cancers with skull metastasis. This duration has been found to be shorter in untreated patients [1,2,10,11].

In conclusion, no single standard postoperative treatment could be established in skull metastasis seen in thyroid cancer, because of its low incidence and lack of data from prospective studies. Total/near total thyroidectomy and metastasectomy should be the treatment of choice in skull metastasis. Postoperative radioactive iodine and radiotherapy should be offered.

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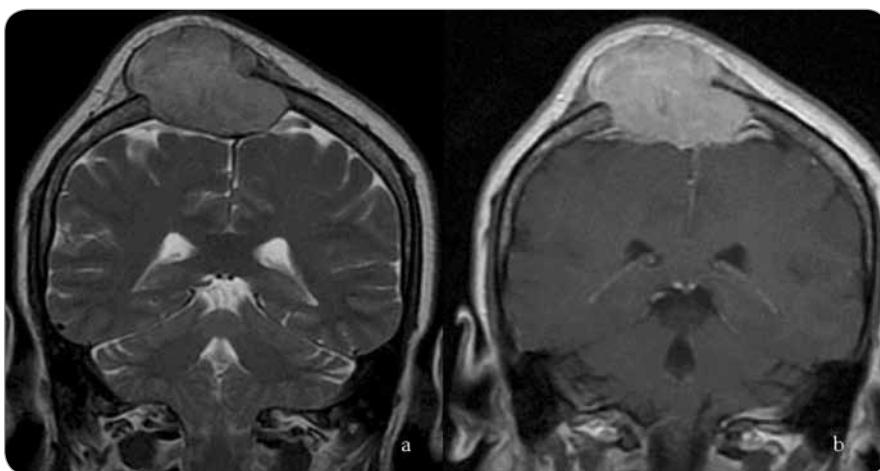


Fig. 1. Coronal T2-weighted fast spin echo and sagittal contrast enhanced T1-weighted MRI images show a calvarial expansile lytic lesion located at the right paramedian frontoparietal region with an intense heterogeneous contrast enhancement. There is also compression and displacement of superior sagittal sinus without any finding of dural invasion.

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