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Pituitary stalk metastasis of a neuroendocrine tumour of unknown origin

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Neoplastic metastases to the pituitary gland occur sporadically with breast, lung, kidney, prostate, and colon cancer domination. Dissemination of neuroendocrine tumours (NETs) to the pituitary fossa is very rare [1]. Despite the dynamic development of laboratory and imaging methods, diagnosis and management of such lesions remain challenging. In our study we present a case of a patient with metastasis of an NET of unknown origin to the pituitary with subsequent multihormonal dysfunction of this gland. To our knowledge, this is one of 5 published cases of NET metastasis to the pituitary stalk [1].

A 73-year-old woman was admitted to the Department of Internal Medicine due to a history of chronic diarrhoea and progressive weight loss. Based on the performed imaging, multiple metastatic lesions to the chest, abdomen, and bones were detected. The presence of NET G3 tissue was confirmed in the biopsy of the L3 vertebrae (Ki-67 — 22%, expression of synaptophysin and chromogranin, expression of somatostatin receptors in 10% of cells) and liver (Ki-67 — 11.7%). Despite numerous biochemical and imaging studies (including scintigraphy with somatostatin analogue), establishing of the primary tumour site was unsuccessful. During hospitalization in the Department of Endocrinology insufficiency of adrenal, thyroid, and gonadal pituitary axes as well as mild hyperprolactinaemia were diagnosed. Adequate hormonal supplementation was introduced. There were no evident clinical and biochemical symptoms of diabetes insipidus (DI). Magnetic resonance imaging (MRI) of the hypothalamo-pituitary area revealed intensively enhancing tumours in the topography of the stalk and dens of the C2 vertebra (Fig. 1). The radiological image of the lesion suggested its metastatic origin. Due to the lack of somatostatin receptor expression in somatostatin receptor imaging, the use of therapy with somatostatin analogues was not offered. By the decision of the multidisciplinary tumour board, the patient was qualified for chemotherapy (capecitabine and temozolomide — CAPTEM) and palliative radiotherapy aimed at the infundibulum and C1/C2 area. Due to severe recurrent respiratory tract infection and anaemia, chemotherapy was discontinued after several treatment cycles. Unfortunately, despite multidirectional treatment, the patient died 2 years after being diagnosed.

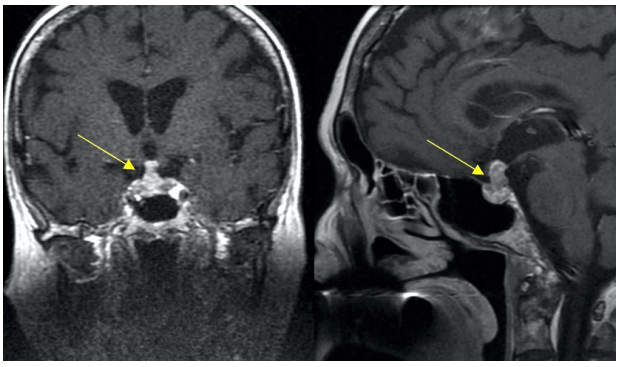

Figure 1. *Magnetic resonance imaging in a patient with disseminated neuroendocrine tumour and pituitary stalk metastasis (arrows)*

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Pituitary metastases (PM) are the cause of less than 1% of pituitary surgeries and constitute around 0.4% of all intracranial metastases [2]. However, some literature data suggest that up to 5% of patients with malignant, disseminated neoplasms may have clinically silent PM [3]. NETs may show aggressive character, but metastases to the pituitary fossa appear to be extremely rare. The female to male incidence ratio is similar, and the mean age at diagnosis is 58 years [1]. Based on the case studies, small-cell lung cancer is the most common primary neoplasm, followed by atypical bronchial carcinoid, pancreatic NETs, and medullary thyroid cancer [1]. The clinical image and MRI findings are similar to those caused by metastases from other neoplasms. Seventeen per cent of patients were diagnosed with concomitant metastases to other central nervous system structures [1]. Stalk involvement was mentioned in 4 reports and one study of 60 consecutive patients with stalk lesions, where, among the whole group, one patient presented NET metastasis to the infundibulum [4]. In a recent literature analysis including 43 patients with PM from NETs, 73% of patients presented with at least one anterior pituitary hormone deficit (gonadal axis insufficiency was the most common). Hyperprolactinaemia and DI were diagnosed in 57% and 35% of those patients, respectively. Both secondary hypocortisolism and hypothyroidism were detected in 40% of cases [1]. Rare cases of hormonally active NET metastases leading to acromegaly and Cushing's syndrome as well as location of PM within pre-existing adenomas ("collision tumours") have been published. The concomitance of sellar mass, DI, and nerve palsies in elderly patients supports the diagnosis of metastatic spread [5]. In terms of treatment modalities, it is worth emphasizing that the median survival for patients undergoing neurosurgery was approximately twice as long as for patients treated conservatively [1]. The occurrence of somatostatin receptors present in some G1 and G2 NETs enables the use of therapy with long-acting and radiolabelled somatostatin analogues. In more aggressive NET G2 additional use of CAPTEM or other targeted therapies with everolimus or sunitinib should be considered.

In conclusion, neoplastic spread to the pituitary gland is rare and poorly documented. Due to potentially life-threatening complications, metastases located in hypophysis require early diagnosis and appropriate treatment. Despite the rarity of NET metastases, the presence of typical symptoms suggesting pituitary insufficiency during follow-up should be routinely assessed.

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References

1. Ragni A, Nervo A, Papotti M, et al. Pituitary metastases from neuroendocrine neoplasms: case report and narrative review. Pituitary. 2021; 24(5): 828–837, doi: 10.1007/s11102-021-01178-9, indexed in Pubmed: 34342837.
2. Habu M, Tokimura H, Hirano H, et al. Pituitary metastases: current practice in Japan. J Neurosurg. 2015; 123(4): 998–1007, doi: 10.3171/2014.12.JNS14870, indexed in Pubmed: 26186025.
3. Moreno-Perez O, Peiró FM, López P, et al. An isolated pituitary metastasis as presentation of a differentiated hepatocellular carcinoma mimicking a nonfunctioning macroadenoma. J Endocrinol Invest. 2007; 30(5): 428–433, doi: 10.1007/BF03346322, indexed in Pubmed: 17598977.
4. Kluczyński Ł, Gilis-Januszewska A, Godlewska M, et al. Diversity of Pathological Conditions Affecting Pituitary Stalk. J Clin Med. 2021; 10(8), doi: 10.3390/jcm10081692, indexed in Pubmed: 33920036.
5. He W, Chen F, Dalm B, et al. Metastatic involvement of the pituitary gland: a systematic review with pooled individual patient data analysis. Pituitary. 2015; 18(1): 159–168, doi: 10.1007/s11102-014-0552-2, indexed in Pubmed: 24445565.