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Case Report

Development of a metachronous adrenal metastasis and a brain metastasis after resection of primary lung carcinoma

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Abstract

The adrenal gland and the brain are one of the most common sites for metastasizing of lung carcinoma, but this rarely occurs within a long time interval. Presenting a 58-year female patient with demonstrated right-lung adenocarcinoma (pT1N1M0), subjected to radical resection and adjuvant chemotherapy. After 40 months the patient was adrenalectomized due to a metastasis in the contralateral adrenal gland. Nine months after that a brain metastasis was established, and resection followed by chemotherapy was performed, to a good outcome. This is a case of development of metachronous single metastases into the adrenal gland and the brain after a long disease-free interval (the time interval from the pulmonary resection until the occurrence of a metastasis), as well as of high survival rate after the elimination of the metastatic lesions. Surgical resection in combination with chemotherapy and radiotherapy leads to improved patients' survival as well as to prolonged disease-free interval until the occurrence of secondary lesions.

Keywords: Adrenal, Adrenalectomy, Brain, Lung carcinoma

INTRODUCTION

The metastases of the Non-Small Cell Lung Carcinoma (NSCLC) are generally multiple, disseminated and associated with poor prognosis. The incidence of single adrenal NSCLC-metastases is low; it has been estimated as 1.6% and 3.5% by two prospective studies (Ettinghausen and Burt, 1991; Porte et al., 1998). Brain metastases have incidence of approximately 25% (Sorensen et al., 1988). Several reports on resection of brain metastases (Burt et al., 1992; Patchell et al., 1990; Read et al., 1989) and other isolated lesions (Luketich et al., 1995) demonstrated that aggressive surgical intervention may be beneficial in certain patients. The use of Whole-Brain Radiation Therapy (WBRT) alone increases the average survival up to 3-5 months (Patchell et al., 1990). According to some authors WBRT combined with radiosurgery or neurosurgical resection may improve the average survival up to 8-11 months (Patchell et al., 1990; Vecht et al., 1993; Pirzkall et al., 1998). For isolated adrenal metastases, a number of authors have demonstrated increased average and overall survival in patients after resection compared to those without (Strong et al., 2007; Sarela et al., 2003; Higashiyama et al., 1994). We hereby present a case of development of a metachronous metastasis into the adrenal gland 40 months after lung resection due to adenocarcinoma, and a metachronous brain metastasis 9 months after the adrenalectomy.

CASE REPORT

In April 2009 a 58-year female patient was subjected to radical right-sided mastectomy with axillary lymphatic node dissection due to a G2-invasive ductal carcinoma

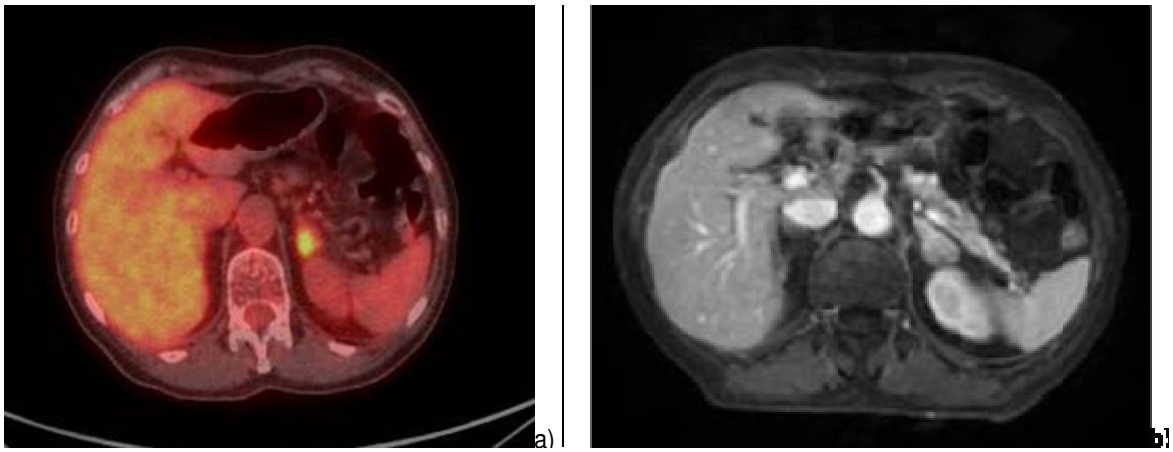

Figure 1 a) PET-CT showing a formation in the left adrenal gland with SUVmax 4.1.
b) CT showing a formation in the left adrenal gland.

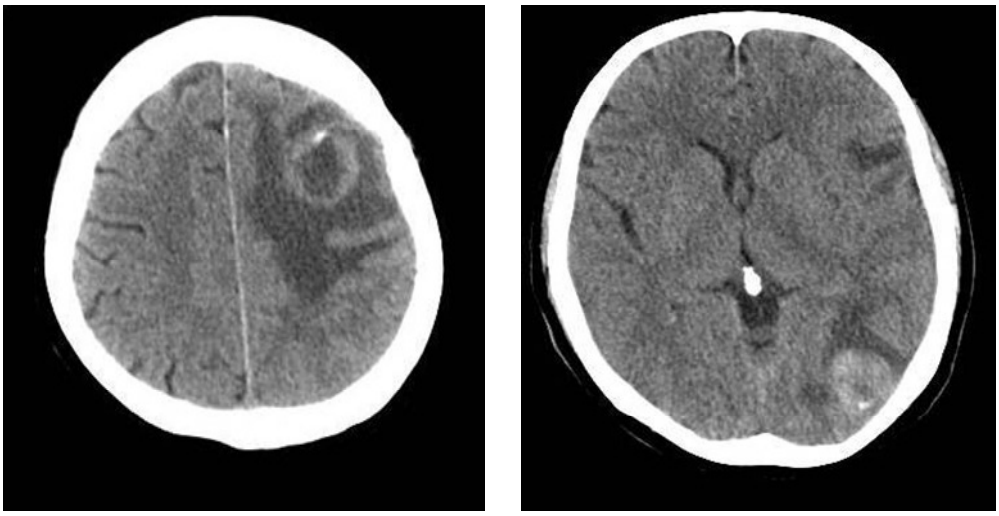

Figure 2. CT of head, showing two brain lesions – left-frontal and left-occipital.

(pT2N0M0). Hormonal analysis showed Ep(3+), Pr(3+), HER through CISH (-). The patient conducted adjuvant radiotherapy up to 46 Gy, treatment with Arimidex and hormonal therapy with Aromasin.

In December 2009 the patient complained of blood in her sputum. CT-scan revealed a formation in the inferior lobe of her right lung with comparatively homogenous structure, sharp contours with spicules at sites, and size 2/2 cm. The formation was found to obturate the proximal part of the 6-th segment bronchus without any increased mediastinal lymphatic nodes observed. Segmentectomy of the 6th pulmonary segment was then performed, along with lymphatic dissection due to macroscopic evidence of metastatic alterations in the hilar, paratracheal and bifurcation lymph nodes. Histological assessment showed primary moderately differentiated lung adenocarcinoma (pT1N1M0). Six courses of Carbo-Tax chemotherapy were conducted after surgery. PET-CT monitoring on the second and third year showed no evidence of recurrence or dissemination of any of the primary malignancies.

In April 2013, however, PET-CT revealed increased metabolic activity SUVmax 4.1 in the left adrenal gland, which was found to be increased in size – 21/18 mm (Figure 1a,b). The formation did not show any hormonal activity. Retroperitoneal endoscopic adrenalectomy was then performed, extracting an adrenal formation with size 2 cm/d. After immunohistochemical assessment of Er/Pr – negative, histological verification proved it to be a metastasis of lung adenocarcinoma.

In January 2014 the patient complained of labored speech and visual disturbances. She had experienced a partial motor seizure of her right extremities without loss of consciousness. Brain MRI revealed two oval supratentorial lesions with size of 25-26 mm, situated peripherally in the left frontal and left occipital area (Figure 2). The structure of the frontal lesion was non-homogenous, with solid periphery and central liquid-

equivalent component. The occipital lesion had solid structure, hypo-intense in T2W and with discretely amplified signal in the T1W-series. The lesions were visualized intraoperatively by means of ultrasound and excised totally. Histological verification showed metastases of lung carcinoma origin. Immuno-histochemical assessment of paraffin slices from both the brain metastasis and the lung adenocarcinoma was conducted, demonstrating identical phenotype. Cytokeratin 7 and TTF1-15 showed strong positive reaction in the majority of tumor cells, and the reaction to Mammaglobin GCDFP-15 was negative. Adjuvant radiotherapy with realized dose up to 30 Gy was conducted. After periodical monitoring of the patient no recurrence of the disorder has been estimated until April 2016.

DISCUSSION

In general, patients with isolated metastases, long disease-free interval after the initial diagnosis, and small tumor size of the metastasis respond better to treatment compared to the rest of the patients (Higashiyama et al., 1994). In our case the disease-free interval from the lung resection to the occurrence of a metastasis in the contralateral adrenal gland was 40 months, and until the development of brain metastases – 49 months. Sarela et al. (2003) and Kim et al. (1998) with the help of multivariate analysis have established that a DFI > 6 months is an independent prognostic factor for increased survival. According to the same authors patients with metachronous tumors have better survival rates than those with synchronous, as was our case. The patient has survived 39 months after the adrenalectomy and 30 months after the resection of brain metastases, with follow-up until July 2016. Higashiyama et al. (1994) have performed three metachronous adrenalectomies due to isolated metastases in patients previously subjected to tumor resection. Two of the patients survived without recurrences for 24 and 40 months respectively after the adrenalectomy. In respect to brain metastases from lung carcinoma, metachronous metastases have better prognosis according to some authors (Mussi et al., 1996), while others suggest that there is no significant difference between metachronous and synchronous lesions in terms of survival (Burt et al., 1992). Mean survival from the diagnosis of brain metastasis until death is approximately one month without treatment, and 14 to 24 months upon combined brain-lung resection (Burt et al., 1992; Read et al., 1989). A comparatively small number of series of adrenalectomies due to NSCLC-metastasis have been reported, with average 5-year survival rate of 25% (Mercier et al., 2005; Porte et al., 2001; Lucci et al., 2005; Strong et al., 2007). As for brain metastases, some authors report 2-year survival in 5-13% of the cases, and 5-year survival rate of 2 – 2.5% (Chao et al., 2006; Lutterbach et al., 2002). According to Raz et al. (2011) the 5-year survival rate of patients subjected to adrenalectomy was 34% compared to those treated non-operatively (p_0.002, long-rank test of survival). Patients with No- and N1-status had overall 5-year survival rates of 52%, while none of the patients with N2-status survived for 5 years (p_0.008). Porte et al. (2001) have not reported any significant differences in survival based on TNM-class.

CONCLUSION

The presence of isolated adrenal and brain metastases from lung carcinoma is a sign for poor prognosis. Nevertheless, in selected patients the aggressive surgical treatment combined with chemotherapy and radiotherapy can both increase the disease-free interval and improve the overall survival, as in our case.

Conflict of Interest

There is no conflict of interest

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