Cutaneous metastasis to scalp in lung carcinoma
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Section: Head & neck imaging
Area of Interest: Head and neck
Procedure: Biopsy
Technique: Ultrasound
Technique: Ultrasound-Colour Doppler
Technique: CT
Special Focus: Metastases Case Type: Clinical Cases
Authors: Nitesh Shekhrajka1, Jens K. Iversen2, Maksim Gospodinov3
Patient: 67 years, male

Clinical History:
A 67-year-old male patient, diagnosed with lung cancer (non-small cell, T4N0M0) 5 months before, receiving palliative radiotherapy was referred to the hospital by a primary care physician for investigation of a 3 cm large cutaneous/subcutaneous mass in the scalp in the occipital region with superficial erosion. He had a previous history of prostate cancer.

Imaging Findings:
PRIMARY ULTRASOUND with a high frequency transducer shows a 2.8 x 3.6 x 1.6 cm hypo-echoic subcutaneous process in the occipital region in the midline and hypervascularity on colour Doppler.

CT of the cerebrum without contrast shows a 3.5 x 4.0 x 2.2 cm subcutaneous mass in the midline of the occipital region without infiltration of the underlying bone. CT also showed a brain metastasis in the left occipitoparietal region.

COARSE NEEDLE BIOPSY AND HISTOLOGY of the lesion showed infiltration of the soft tissue with non-small cell cancer (NSCLC) cells.

IMMUNO-HISTOLOGICAL STUDIES showed that the infiltrative tumour cells were positive for CK7 and TTF-1 and negative for CK20 and PSA (to differentiate it from a possible metastasis of prostate carcinoma).

FINAL DIAGNOSIS: A cutaneous metastasis from a non-small cell lung carcinoma (adenocarcinoma in this case).

Discussion:
BACKGROUND:
Lung cancer is the second most common type of malignancy and the leading cause of death from cancer. [1]

Most common sites of metastasis include the bones, liver, adrenal gland, and brain. While the skin is rarely affected, it is an indicator of poor prognosis. [2]

Approximately 1–12% of patients with lung cancer develop cutaneous metastases. [3] Adenocarcinomas are
tumours with a higher tendency to spread to the skin and large cell carcinomas are tumours with the lowest tendency. [11, 12]

The skin is a rare site of metastasis in internal malignancies and concerns less than 4.5% of these cancers. [2, 4, 5] Malignancies that show the greatest tendency to spread to the skin are gastric, renal, breast and pulmonary cancers. [6, 7]

The metastatic tumour from lung carcinoma can be located anywhere in the skin, but it mainly affects areas close to the primary tumour. [4] The metastasis may therefore be located at the thorax, back, abdomen. [4, 6, 7] or the umbilicus (Sister Mary Joseph's nodule). [3] The scalp is a favourite site of cutaneous metastasis of lung cancers representing 54% of all cutaneous metastases of this cancer. This finding could be explained by the rich blood flow in the scalp. [3, 4, 7]

CLINICAL PERSPECTIVE:

Clinical manifestations of skin metastases were classified as nodular, inflammatory, and sclerodermoid metastatic lesion by Brownstein and Helwig. [8] Nodular lesions, often multiple, are the most frequent ones. [3]

Nodular lesions can be either solitary or clustered, usually painless, 0.5 to 5 cm in size, but lesions measuring 15 cm or more are also encountered. They may appear as inflammatory or ulcerating, but also as erythematous papulae. [2]

They are generally the result of a haematogenous spread of cancer cells such as small cell cancer, squamous cell cancer and other pulmonary carcinomas. [4]

A biopsy should be performed whenever a skin lesion appears especially in a smoker or in a patient with lung cancer. [3]

Immunochemistry is very useful by studying the CK7? CK20 immunostaining and the expression of TTF1 in cases of adenocarcinoma. A massive nuclear expression of TTF1 is characteristic of primary lung cancer and thyroid carcinoma. [3]

OUTCOME:

The presence of skin metastases indicates an ominous prognosis. If other extracutaneous metastases exist, median survival does not exceed three months. [2, 9] However, if the skin is the only site of metastatic disease, survival can reach 10 months. [2, 10]

**Differential Diagnosis List:** Cutaneous metastasis to the scalp secondary to lung carcinoma (NSCLC), Squamous cell carcinoma, Spinocellular carcinoma

**Final Diagnosis:** Cutaneous metastasis to the scalp secondary to lung carcinoma (NSCLC)

**References:**


Description: Ultrasound of the occipital region showing a hypoechoic subcutaneous lesion measuring 3.6 x 1.6 cm. Origin: Radiologisk afd., Århus sygehus, NBG
Description: Ultrasound of the occipital region showing a hypoechoic subcutaneous mass measuring 2.7 cm in anteroposterior dimension. Origin: Radiologisk afd., Århus sygehus NBG
Description: Ultrasound of the occipital region with colour Doppler showing increased flow within the mass. Origin: Radiologisk afd., Århus sygehus, NBG
Description: CT showing a subcutaneous mass in the occipital region. Origin: Radiologisk afd., Regionhospitalet Horsens
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Description: Coronal plane CT showing a subcutaneous mass in the occipital region. Origin: Radiologisk afd., Regionshospitalet Horsens
Description: Coronal plane CT showing a subcutaneous mass in the occipital region. Origin: Radiologisk afd., Regions hospitalet Horsens
Description: Sagittal plane CT examination showing a subcutaneous mass in the occipital region.
Origin: Radiologisk afdeling, Regionshospitalet Horsens
Figure 10

Description: Coronal Plane CT in bone window setting shows no bone infiltration by the mass. Origin: Radiologisk afdeling, Regionshospitalt Horsens
Description: Sagittal plane CT scanning in bone window setting shows no infiltration by tumour to the underlying bony structure. Origin: Radiologisk afd., Regionshospitalet Horsens