Case 14132

Breast and axillary metastases from transitional cell carcinoma of the renal pelvis. A case report.
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Section: Breast imaging
Area of Interest: Breast Thorax Abdomen Kidney
Procedure: Biopsy
Procedure: Imaging sequences
Procedure: Contrast agent-intravenous
Procedure: Contrast agent-oral
Procedure: Localisation
Imaging Technique: Image manipulation / Reconstruction
Imaging Technique: CT
Imaging Technique: Mammography
Imaging Technique: Ultrasound
Imaging Technique: Fluoroscopy
Special Focus: Metastases Infection Neoplasia Case
Type: Clinical Cases
Authors: Mavromati Areti, Drabløs Ole, Ege Jon, Nes Harald, Radiology Department, Igor Plotnikov Pathology Department, General Public Hospital of Haugesund, Norway.
Patient: 80 years, female

Clinical History:

An 80-year-old woman with only high blood pressure in her medical history presented to our hospital with dizziness and weight loss of 6 kg in the last 6 months. The blood test results showed increased CRP=70 and leukocytes 15.
Imaging Findings:

The imaging process included a chest X-ray (fig.1) followed by a CT thorax/abdomen/pelvis that revealed pathological findings in the left renal pelvis (fig.3), the right 6th rib (fig.2), and the right breast (fig.2). Mammography and breast ultrasound showed one suspicious lesion in the breast (fig.4, 5) and one in the axilla (fig.6). Ultrasound-guided core biopsy (fig.7) was taken from the breast lesion. The pathologic diagnosis was challenging, the proliferation had histological features of primary breast carcinoma (IDC). The surgical team proceeded to a wire guided lumpectomy of the right breast (fig.9) with sentinel node excision. Meanwhile, an anterograde renal biopsy was performed (fig.8) that showed transitional cell carcinoma of the renal pelvis (fig.10a, b, c). The pathologists took under consideration the possibility that the breast and axillary lesions were metastases from the TCC so they used histopathologic and immunohistochemical examinations for their final diagnosis: metastatic TCC in both breast and axilla (fig.11a, b, c).

The therapeutic approach included laparoscopic nephrectomy and open surgery-nefrouretectomy.

Discussion:

Metastases to the breast from non-mammary primary tumours are uncommon and vary between 0.2% and 1.3%. Higher frequencies of 2–7% are seen in postmortem studies [2]. Women are affected five to six times more frequently than men. No clear predisposing factors correlating with the development of breast metastases have been identified [1].

Metastases to the breast from non-mammary malignancies are rare and show pathologic features of primary tumours. It is usually presumed to be a primary breast carcinoma. Histopathologic features and clinical history in conjunction with the immunohistochemical results should be considered in differentiating a secondary mass from a primary breast carcinoma [3].

Clinically, the metastatic lesions are not distinct from primary tumours: the patient presents with palpable mass/masses which are most often located in the upper outer quadrant of the breast. Multiple, diffuse and bilateral involvement is rare. Also relatively rare is the involvement of the axillary nodes [5]. Among metastatic lesions to the breast, carcinoma of the opposite breast, multicentric lymphoid malignancies, and disseminated melanoma constitute the most likely sources. Other, less common sources are carcinomas of the lung, ovary, or stomach, and, infrequently, carcinoid tumours, hypernephromas, and carcinomas of the liver, tonsil, pleura, pancreas, cervix, perineum, endometrium, and bladder. Regarding children and adolescents, rhabdomyosarcoma is one of the common tumours reported to give rise to breast metastasis. Other neoplasms are leukemia, lymphoma, Ewing sarcoma, neuroblastoma, and yolk sac tumour. Metastases to the male breast is also very infrequent but has been reported in prostatic adenocarcinoma [1].

On mammography, metastatic lesions may manifest as single or multiple masses or as diffuse skin thickening. The metastatic lesions usually appear as round masses with circumscribed or ill-defined borders. They typically lack spiculation. Microcalcifications are rare but can occur with some primary type (e.g. psammoma bodies in ovarian cancer)[5].

On ultrasound, metastatic masses appear hypoechoic with circumscribed margins and, occasionally, posterior acoustic enhancement. Colour Doppler interrogation more often shows increased vascularity [1, 6].

In conclusion, metastases to the breast and/or axilla represent an important diagnostic consideration as these patients have a poor prognosis [1-5], with more than 80% dying within 1 year [1]. This poor survival is due to the fact that at the time of the discovery of the breast lesion, the majority of the patients already have widely metastatic disease.

So, reaching the correct diagnosis is crucial in order to avoid unnecessary procedures and treatments in these patients [1, 2].
Differential Diagnosis List: Breast and axillary metastases from TCC of the renal pelvis., fibroadenoma, mucinous breast cancer, medullary breast cancer, papillary breast cancer, IDC

Final Diagnosis: Breast and axillary metastases from TCC of the renal pelvis.

References:

Zhou S1, Yu B2, Cheng Y1, Xu X1, Shui R1, Bi R1, Lu H1, Tu X1, Yang W1. (2014) Metastases to the breast from non-mammary malignancies: a clinicopathologic study of 28 cases. PubMed 43(4):231-5. (PMID: 24915812)
Deborah F DeLair1, Adriana D Corben1, Jeffrey P Catalano1, Christina E Vallejo1, Edi Brogi1 and Lee K Tan1 (2013) Non-mammary metastases to the breast and axilla: a study of 85 cases. Modern Pathology 26, 343–349; doi:10.1038 (PMID: 23174933)
Description: A blind biopsy from the renal pelvis under fluoroscopic guidance was performed that showed transitional cell carcinoma. Origin: Haugesund’s Public Hospital, Norway.
Description: A right parapleural density is seen, originally thought to represent pulmonary infection or empyem. Origin: Department of Radiology, Haugesund General Hospital, Norway.
Figure 3

Description: Left kidney with hydronefrosis and a stenotic area with contrast enhancement to the renal pelvis that indicates the presence of a tumour. No stones or calcifications are visible. Origin: Department of Radiology, Haugesund General Hospital, Norway.
**Description:** There is a contrast enhanced nodule in the right breast and a mixed destructive metastasis with a soft tissue mass to the right 6th rib. **Origin:** Department of Radiology, Haugesund General Hospital, Norway.
Description: There is a hypoechoic, well defined lesion with an increase of echogenisity in the surrounding tissue. Clinically this lesion was palpable. Origin: Radiology Department, Haugesund General Hospital, Norway.
Description: A lymphnode with suspicious echo pattern in the right axilla (rounded with no hyperechoic hilum).
Metastasis from primary breast cancer was suspected. Origin: Department of Radiology, Haugesund General Hospital, Norway.
Description: An ultrasound guided core needle biopsy was taken from the breast lesion. Origin: Department of Radiology, Haugesund General Hospital, Norway.
**Figure 8**

Description: A radiopaque nodule is seen adjacent to the axillary basis (the nodule was not visible to the CC view).

The lesion was suspicious for primary breast cancer. **Origin:** Department of Radiology, Haugesund General Hospital, Norway.
Figure 9

Description: Ultrasound guided wire localization of the breast lesion preceded the lumpectomy. Origin: Department of Radiology, Haugesund General Hospital, Norway.
**Figure 10 a**

**Description:** Malignant, infiltrating tumour of the renal pelvis consisting of groups of atypical transitional epithelial cells with significant variation in nuclear pleomorfi. Plate epithelial differentiation and atypical mitoses are seen focally. **Origin:** General public hospital of Haugesund, Norway
**Description:** The tumour shows aggressive behavior with renal parenchymal invasion (the tumor is seen on the right side and the renal tissue on the left side of the picture. **Origin:** General public hospital of Haugesund, Norway
Description: Typical immunohistochemical TCC profile CK7 + / CK20 + / UROPLAKIN + CK5 / 6 +.
Origin: General public hospital of Haugesund, Norway
Description: Immunohistochemical profile typical for TCC: CK20 + (in this picture) / P63 + / CK5 / 6 +

(In case of a primary breast cancer the markers should be: CK20- / P63- negative but CK5 / 6 - / +
varying). Origin: General public hospital of Haugesund, Norway
Description: P63 + Origin: General public hospital of Haugesund, Norway

Description: CK5/6 + Origin: General public hospital of Haugesund, Norway