A pictorial review of metastases to the breast from extra-mammary primary tumours.

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**INTRODUCTION:**
Metastases to the breast comprise 0.5-2% of all breast malignancies. Typical radiographic appearances form a wide spectrum. Knowledge of features which distinguish metastatic tumours from primary breast malignancy can inform initial diagnosis and direct investigation and timely appropriate management.

**BACKGROUND:**
The first case of a metastatic lesion to the breast is thought to have been reported by Trevithick in 1903 (1). The most common primary malignancies which metastasise to the breast are lymphoma/leukaemia, ovary, kidney, lung, melanoma, gastric and prostate, although any primary tumour has the potential for intra-mammary spread (1).

A study by Abbas et al in 2013 demonstrated that metastases showed two main radiological patterns; intramammary masses (81.5%) and architectural distortion (18.5%) (2). Carcinomas of the stomach presented more frequently as an architectural distortion, whereas other malignancies tended to form intramammary masses.

Sonographic findings are typically of a well-circumscribed ovoid hypoechoic mass, occasionally demonstrating posterior acoustic enhancement. Unlike primary breast cancer, calcification is rare.

Typical radiographic appearances are similar to metastases elsewhere; ovoid, well-defined lesions. Metastatic breast lesions do not cause retraction of the skin or nipple and tend to be located in the subcutaneous fat whereas primary breast cancers develop in the glandular tissue.

**CONCLUSION:**
Metastatic tumours in the breast have a wide range of radiographic appearances, with some resembling benign lesions. Review of previous imaging (e.g CT) is important. Any newly developed mass in a patient with a known history of extramammary malignancy, should undergo biopsy for pathologic confirmation. The breast radiologist needs to be aware that abnormalities within the breast and axilla may occasionally be metastatic.

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**Case Reports:**

**Case 1:**
59 year old lady with a previous history of breast cancer who had just completed chemotherapy for ovarian carcinoma and presented with a palpable lump in the right breast.

US: Two discrete well-defined lobulated hypoechoic masses with posterior acoustic enhancement.

Histology: Features are similar to the previous tumour from an omental biopsy; a high grade metastatic serous adenocarcinoma.

**Case 2:**
14 year old girl with known Acute Lymphoblastic Leukaemia, presented to the breast clinic with a painful, swollen right breast.

US: The right breast is generally swollen and tender. There is very prominent glandular breast tissue with increased vascularity throughout the whole breast, and not just at the area of maximal tenderness in the upper half.

Histology: Core biopsy demonstrated a malignant tumour consisting of small cells consistent with Acute Lymphoblastic Leukaemia.

**Case 3:**
54 year old lady presented for her second round of breast screening. Dense lymph nodes were noted bilaterally, with no breast abnormality demonstrated.

Histology: Core biopsy of a right axillary lymph node demonstrated a high grade lympho-histiocytic lymphoma, grade 1 or 2.

**Case 4:**
59 year old lady with a previous history of breast cancer who had just completed chemotherapy for ovarian carcinoma and presented with a palpable lump in the right breast.

Histology: Core biopsy of a right axillary lymph node demonstrated a high grade lympho-histiocytic lymphoma, grade 1 or 2.

**Case 5:**
45 year old lady with melanoma

Left knee radiograph showing lytic lesions from melanoma.

Ultrasound left breast showing incompletely well defined low echogenic mass

Melanoma metastasis left breast with target appearance

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**References:**
1) H Knipe, F Gaillard et al. Metastases to the breast. www.radiopaedia.org